001787

REMEDIAL ACTION COMPLETION REPORT

ASBESTOS CONTAINING MATERIAL, LEAD-CONTAMINATED SOIL AND SEPARATOR

Prewitt Refinery Site
Prewitt, NM

Prepared for:

Atlantic Richfield Company/
El Paso Natural Gas Company

April 1996

Volume 1 of 3

Applied Hydrology Associates, Inc.

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Volume 1 of 3

Prepared By: Arthur P O'Hare April 15, 1996 Date

Approved and Certified By: Henry C. Meier 4/17/96 Date
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ACRONYMS AND ABBREVIATIONS

This document utilizes the following organization abbreviations. Abbreviations used in the Contract Documents shall be interpreted according to their recognized and well-known technical or trade meanings; such abbreviations include but are not limited to the following:

AHA	Applied Hydrology Associates, Inc.
ARCO	Atlantic Richfield Company
COE (or U.S. COE)	U.S. Corps of Engineers
DOT (or U.S. DOT)	U.S. Department of Transportation
DSI	Dominion Services, Inc.
EPA (or U.S. EPA)	U.S. Environmental Protection Agency
EPNG	El Paso Natural Gas Company
NMED	New Mexico Environment Department
NSP	Navajo Superfund Program
OSHA	Occupational Safety and Health Administration
SET	Smith Environmental Technologies, Inc.

Common technical abbreviations which may be found in this report are listed below:

ACM	Asbestos Containing Materials
AHERA	Asbestos Hazard Emergency Response Act
amsl	Above Mean Sea Level
BTU	British Thermal Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CPC	Contaminants of Potential Concern
EPA	Environmental Protection Agency
ft.	Feet
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
HEPA	High Efficiency Particulate Absolute
hr.	Hour

ACRONYMS AND ABBREVIATIONS
(Continued)

kg	Kilogram
L	Liter
lb, lbs	Pound, Pounds
LTRA	Long Term Remedial Action
mg.	Milligram
mg/L	Milligram per Liter
NAPL	Non-Aqueous Phase Liquid
NPL	National Priorities List
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
PAH	Polynuclear Aromatic Hydrocarbons
PLM	Polarized Light Microscopy
ppb	Parts Per Billion
PPE	Personal Protective Equipment
ppm	Parts Per Million
PRP	Potentially Responsible Party
QAP	Quality Assurance Plan
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act of 1976 (PL-94-580)
RD	Remedial Design
RD/RA	Remedial Design/Remedial Action
RI	Prewitt Refinery Site Remedial Investigation (February 21, 1992)
RI/FS	Remedial Investigation/Feasibility Study
RPM	Regional Project Manager (EPA)
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SC/QAO	Supervision Contractor/Quality Assurance Official
sq. ft.	Square Foot
SOW	Statement of Work

ACRONYMS AND ABBREVIATIONS
(Continued)

TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
μg/L	Microgram Per Liter
VOC	Volatile Organic Carbon
WHSP	Worker Health and Safety Plan
XRF	X-Ray Fluorescence
yr	Year

EXECUTIVE SUMMARY

The Prewitt Refinery Superfund Site is a former crude oil refinery located in McKinley County, New Mexico, approximately 20 miles northwest of Grants, New Mexico. The refinery was in operation from approximately 1938 to 1957, and was dismantled in 1966. The Prewitt Refinery was placed on the National Priorities List on August 30, 1990 by the U.S. Environmental Protection Agency, Region VI (EPA). The Record of Decision (ROD) prescribing the remedial activities to be undertaken at the Site was issued by EPA on September 30, 1992. A Unilateral Administrative Order, Docket Number 6-17-93 (The Order) was issued jointly to Atlantic Richfield Company (ARCO) and El Paso Natural Gas (EPNG) on May 14, 1993. The Order requires ARCO and EPNG to conduct the Remedial Design (RD) and the Remedial Action (RA) in accordance with the ROD.

The RD Report which was approved by EPA on January 17, 1995, addressed the following components: 1) asbestos-containing materials; 2) lead-contaminated soil; 3) separator contents, separator structure and separator subsoils; and 4) Phase 1 subsurface remediation. The RA Work Plan, which addressed implementation of the remedy components, was submitted and approved by EPA on February 28, 1995. The remedial action began in May 1995 following selection of the RA Contractor, and the Supervising Contractor and Quality Assurance Official (SC/QAO). This RA Completion Report covers the completion of remedial action for asbestos-containing materials (ACM), lead-contaminated soil, and the separator contents, separator structure and separator subsoils.

The RA Completion Report was prepared and submitted in accordance with Section IX, B(56) of the Order, which requires ARCO and EPNG to submit a written report following the pre-certification inspection which certifies that the Remedial Action has been completed in full satisfaction of the requirements of the Order. This RA Completion Report includes the required construction reports for these surface remedy components; the required evaluation of excavation, treatment, and disposal; and the necessary documentation of compliance with the requirements of the RD.

The remedial action for Asbestos Containing Material (ACM) was implemented in accordance with the RD and the Order to control or eliminate human exposure to asbestos-contaminated soils and asbestos containing materials at the Site. During implementation of the remedial action for ACM, a total of 282 cubic yards of bulk ACM and asbestos-contaminated soil, 0.81 cubic yards of asbestos-contaminated personal protective equipment, and 2.54 cubic yards of non-friable ACM were removed from the Site and transported to the Keers Environmental Special Waste Monofill in Mountainair, New Mexico. This substantially exceeds the 17 cubic yards of ACM estimated in the ROD. In addition, 91.3 cubic yards of hydrocarbon- and lead-contaminated ACM were removed and transported to the U.S. Ecology facility in Beatty, Nevada. There was no hydrocarbon- or lead-contaminated ACM estimated in the ROD.

The remedial action for Lead-Contaminated Soil was implemented in accordance with the RD and the Order to control or eliminate human exposure to lead-contaminated soils at the Site. A total of 2,733 cubic yards (3,830 tons) of lead-contaminated soil was excavated and disposed off-site during implementation of the Remedial Action for lead-contaminated soil. This was considerably greater than the 1,900 cubic yards estimated in the ROD. Lead-contaminated soil removed from the Site was transported to two different disposal facilities depending upon the characteristics of the waste and the acceptance criteria required by the facility. A total of 1,503 tons of non-hazardous lead-contaminated soil was removed from the Site and transported to the Waste Management landfill facility in Rio Rancho, New Mexico. An additional 2,182 tons of hazardous lead-contaminated soil were removed and transported to the U.S. Ecology facility in Beatty, Nevada for disposal along with 145 tons of non-hazardous lead-contaminated soils with hydrocarbon concentrations that exceed the acceptance criteria for the Waste Management landfill facility in Rio Rancho.

The remedial action for the separator was implemented in accordance with the ROD, the Order, and the RD to control or eliminate human exposure to the separator contents and to any contamination associated with the separator structure. Although the RD specified cement kiln treatment for the separator sludge, during sludge profiling the BTU content was found to be lower than acceptable for cement kiln treatment. An additional sample was taken which confirmed these results. On-site stabilization with cement followed by thermal desorption at the Bird Environmental facility in San Leon, Texas and disposal of treatment residuals at the Chemical Waste Management facility in Carlyss, Louisiana was selected and approved by EPA for treatment and disposal of the separator sludge.

A total of 111 tons of hazardous (F037) separator sludge that was stabilized with cement prior to excavation, was transported off-site for thermal desorption treatment at the Bird Environmental facility in San Leon, Texas. An additional 91 tons of concrete from the separator structure and 5.2 tons of debris consisting of piping and the secondary tank were profiled and transported to the U.S. Ecology facility in Beatty, Nevada for disposal as hazardous (F037) debris. Following removal of the separator structure, 106 yards of separator subsoil were excavated and temporarily stockpiled. A composite sample of separator subsoils was analyzed for lead and TCLP-lead. These results indicated that the waste was acceptable for treatment in the on-site landfarm during implementation of the landfarm remedy.

Removal and stockpiling of hydrocarbon-contaminated soils encountered during lead-contaminated soil remediation, construction of the subsurface remediation system, and general debris clean-up at the Site was also completed in accordance with the approved RD. Composite soil samples were collected for confirmatory sampling and analyzed for semi-volatile organics at all hydrocarbon soil excavations of less than 4 feet in depth in accordance with the RD. The confirmatory sampling conducted during this work indicates that clean-up criteria for hydrocarbon soils were attained at all the hydrocarbon-contaminated soil excavations.

A total quantity of approximately 2,000 cubic yards of non-hazardous hydrocarbon-contaminated soil were excavated and temporarily stockpiled. Over 15,000 cubic yards of clean soil excavated during construction of the diversion channels were brought in for backfilling these hydrocarbon soil locations and for backfilling and grading the ACM removal areas and the debris removal areas. Following backfilling and grading of the hydrocarbon-soil excavations, the ACM removal areas, and the debris removal areas, these areas were fertilized, disked, and drill seeded in accordance with the RD.

The Pre-Certification/Pre-Final inspection for remediation of asbestos containing materials, lead-contaminated soil, and the separator was conducted on November 28, 1995. No outstanding issues or punch list items were identified during the Pre-Certification/Pre-Final Inspection. The Draft Remedial Action Completion Report was submitted to EPA on February 23, 1996. A Final Certification Inspection was completed by EPA on March 7, 1996 and a certification of completion of the surface remedy components was prepared by EPA on March 19, 1996.

1.0 INTRODUCTION

1.1 Purpose of Report

This report was prepared and is submitted in accordance with the Section IX, B(56) of the Order, which requires ARCO and EPNG to submit a written report following the pre-certification inspection which certifies that the remedial action has been completed in full satisfaction of the requirements of the Order. In accordance with the approved RA Work Plan, which was prepared in compliance with the Order, the Pre-Final Inspections and the Pre-Certification Inspection were combined into one Pre-Final Inspection for the surface remedy components which do not have a Long-Term Remedial Action (LTRA) phase. The Pre-Final Inspection for these surface remedy components (asbestos-containing materials; lead-contaminated soils; and the separator) was conducted on November 28, 1995.

This Remedial Action Completion Report for surface remedy components (i.e., lead-contaminated soils, ACMs, the separator) provides construction information and requests for certification inspection and for certification of completion of the remedy components. This report also contains excavation, treatment and disposal evaluations for each surface remedy component which details the results of confirmatory sampling and documents that the remedy component has been implemented in accordance with the Order and the RD. This report was reviewed and certified by a Professional Engineer.

Following the Final Certification Inspection on March 7, 1996, EPA provided in a letter dated March 19, 1996, a written certification of completion for the surface remedy components (i.e., lead-contaminated soils, ACMs, the separator).

1.2 Report Organization

The RA Completion Report for ACM, lead-contaminated soil, and the separator is submitted in three Volumes. Vólume 1 contains the report text which consists of six chapters. Volume 2 and 3 contain the Appendices which include analytical results, manifests, correspondence and procedures.

Chapter 1 describes the purpose and scope of the report, provides background information, and describes the initiation of RA work at the Site. Chapter 2 describes the asbestos removal action, summarizes the nature and volume of asbestos containing material (ACM) removed from the Site, provides the names and locations of the disposal facilities which received the ACM, and provides the results of confirmatory sampling. Chapter 3 describes the lead-contaminated soil removal action, summarizes the nature and quantity of lead-contaminated soil removed from the Site, provides the names and locations of the disposal facilities which received the lead-contaminated soil, and provides the results of delineation sampling and confirmatory sampling. Chapter 4 describes the remediation of the separator, summarizes the nature and quantity of separator sludge, separator debris, and separator subsoil removed, provides the names and locations of the disposal facilities which received the separator sludge and separator debris, and provides the results of sampling. Chapter 5 describes the excavation and temporary stockpiling of hydrocarbon-contaminated soils that were encountered during completion of lead-contaminated soil remediation, construction of the subsurface remediation system, and general debris clean-up at the Site. It also provides the results of confirmatory sampling of hydrocarbon soil excavations. Chapter 6 describes the Pre-Final/Pre-Certification Inspection and the Final Certification Inspection. It also includes the certification of completion of the surface remedy components.

1.3 Background and Supporting Documents

The Prewitt Refinery Superfund Site is a former crude oil refinery located in McKinley County, New Mexico, approximately 20 miles northwest of Grants, New Mexico. The

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refinery was in operation from approximately 1938 to 1957 and was dismantled in 1966. The Prewitt Refinery was placed on the National Priorities List on August 30, 1990, pursuant to Section 105 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the U.S. Environmental Protection Agency, Region VI (EPA). A Remedial Investigation/Feasibility Study was conducted by Atlantic Richfield Company (ARCO) and El Paso Natural Gas Company (EPNG) pursuant to a Consent Order jointly issued to ARCO and EPNG on July 26, 1989. The Prewitt Refinery Site Remedial Investigation (RI) was submitted to EPA on February 21, 1992. The Prewitt Refinery Site Feasibility Report (FS) was submitted to EPA on February 27, 1992.

The Record of Decision (ROD) for the Site was issued by EPA on September 30, 1992. The remedial action for the Site selected by EPA in the ROD has five components which will be implemented during the remedial action. These components are: 1) asbestos-containing materials; 2) lead-contaminated soil excavation; 3) separator contents and subsoil excavation, treatment and disposal; 4) construction of a NAPL extraction system; 5) construction of a ground water extraction and treatment system; 6) excavation and land farming of West Pits contents and hydrocarbon-contaminated soils.

A Unilateral Administrative Order, Docket Number 6-17-93 (The Order), which addresses the Remedial Design (RD) and the Remedial Action (RA) was issued jointly to ARCO and EPNG on May 14, 1993. The remedy is being implemented in phases consistent with the approved RA Work Plan which was approved by EPA on February 28, 1995. The RD Report for surface and subsurface remediation at the Prewitt Refinery Site was prepared by ARCO/EPNG and was approved by EPA on January 17, 1995. This RD Report provided design plans and specifications for the facilities and activities for the following components: 1) asbestos-containing materials; 2) lead-contaminated soil excavation; 3) separator contents, separator structure and separator subsoils; and 4) Phase 1 subsurface remediation. As specified in the approved RA Work Plan, the RD for the excavation and landfarming of West Pits content and hydrocarbon-contaminated soils was not submitted with the original RD because information on the quantity of separator subsoils was needed to determine the approximate volume of hydrocarbon soil. Nevertheless, following removal of separator subsoils, the final design for the excavation and landfarming of West Pits contents and hydrocarbon-contaminated soils has been completed and approved by EPA on October 26, 1995.

An RA Work Plan was developed in accordance with the RD and the Order. The Final RA Work Plan addressing EPA comments and corrections was approved by EPA on February 28, 1995. This RA Completion Report addresses completion of the following surface remedy components: 1) asbestos-containing materials; 2) lead-contaminated soil excavation; 3) separator contents, separator structure and separator subsoils. This RA Completion Report was prepared consistent with the approved RA Work Plan, the RD Report, the Order, and the ROD.

1.4 Initiation of Remedial Action

EPNG/ARCO implemented the remedial action for the lead soil, asbestos material and separator area in accordance with the RD and the RA Work Plan. EPNG/ARCO assumed overall project management, financial control, contract management, and interface communication with EPA and NMED. EPNG/ARCO conducted a competitive bid process to retain an outside party to serve in the role of both the "Supervising Contractor" and the "Quality Assurance Official". EPNG/ARCO selected Applied Hydrology Associates, Inc. (AHA) to serve as the Supervising Contractor and Quality Assurance Official (SC/QAO) for construction. The SC/QAO was assisted by technicians retained by ARCO/EPNG through a local contractor to assist in sampling activities.

Likewise, EPNG/ARCO developed a list of qualified RA contractors to provide bids on the surface remedial action specified in the RD. The list of qualified contractors was developed based on the demonstrated experience of the contractor with a particular work area, past history with the contractor, demonstrated ability to successfully complete projects for EPNG or ARCO, demonstrated experience on similar projects, financial capabilities, necessary health and safety training, other required training, certifications and licenses, location of personnel and equipment and overall size of the firm relative to the size of the contract. ARCO/EPNG identified local contractors, including Navajo-owned firms, for inclusion on the list of qualified RA Contractors and for consideration as qualified subcontractors. All contractors were required to submit all proposed subcontractors at the time of bidding. Following review of the competitive bids, EPNG/ARCO selected Smith Environmental Technologies, Inc. (SET) as the Remedial Action Contractor. SET proposed to conduct the ACM removal work using a subcontractor.

A Pre-Construction Conference was held at the Site on May 4, 1995 prior to the start of construction of the remedy. Participants in the Pre-Construction Conference included the ARCO/EPNG Project Managers, the EPA Remedial Project Manager, the SC/QAO, and the Project Manager and Site Supervisor from SET. Project issues discussed during the Pre-Construction Conference included: the location of construction facilities, health and safety issues and emergency response plans, site security, equipment procurement, and the proposed schedule for remedial action activities.

Also, after introduction of project personnel and contractor personnel, responsibilities and coordination among all parties involved in the Remedial Action were reviewed. The responsibilities of the SC/QAO included providing an adequate level of inspection of construction activities and developing the necessary documentation to demonstrate to ARCO/EPNG and the EPA that the Remedial Design has been implemented in accordance with the approved Remedial Design and the Order. The SC/QAO was also responsible for all confirmatory sampling and field delineation of surface removal locations. The RA Contractor was responsible for implementation of site remedial action activities in accordance with the RD Report and the RA Work Plan. The RA Contractor was also responsible for sampling and profiling remediation wastes for off-site transportation and disposal.

The SC/QAO started soil sampling and XRF analysis for delineation of lead-contaminated soil excavation on May 1, 1995. Also, ARCO/EPNG installed a pump in the Shop Well to provided water supply for dust suppression and other non-potable use at the Site. The RA contractor arrived on Site on May 17, 1995 to established Site headquarters. At the same time, the RA contractor also started interviewing local labor for employment at the Site. A Contractors' Health and Safety meeting was held on Site on May 18, 1995. Remedial action work started immediately following the Contractor's Health and Safety meeting.

Remedial action activities, confirmatory sampling and analytical results, and the volume and characteristics of wastes removed from the Site are described for each surface remedy component in the subsequent chapters.

2.0 REMEDIATION OF ASBESTOS CONTAINING MATERIALS

The Remedial Action for (ACM) was implemented in accordance with the (RD), the (RA) Work Plan, and the Order to control or eliminate human exposure to asbestos-containing materials at the Site. This chapter describes the removal action, summarizes the nature and volume of ACM removed from the Site, provides the names and locations of the disposal facilities which received the ACM, and provides the results of confirmatory sampling.

The ACM was excavated, treated, and disposed of according to the ROD and the excavated areas have been backfilled. Although the ROD had indicated the volume of ACM removal to be about 17 cubic yards from at least six locations at the Site, during implementation of the remedial action a total of 377 cubic yards of ACM, hydrocarbon-contaminated ACM, lead-contaminated ACM, and non-friable asbestos, were removed from scattered locations throughout the Site. A total of 282 cubic yards of ACM, 0.81 cubic yards of asbestos-contaminated PPE, and 2.45 cubic yards of non-friable asbestos were removed and transported to the Keers Environmental Special Waste Monofill in Mountainair, New Mexico. In addition, a total of 91.3 cubic yards of hydrocarbon- and lead-contaminated ACM was removed and transported to the U.S. Ecology Hazardous Waste Facility in Beatty, Nevada.

2.1 Remedial Design Requirements

The remedial action goal for ACM is to control or eliminate human exposure to asbestos-contaminated soils and ACMs. To achieve this goal, the RD specified removal of bulk materials and soils containing greater than one percent asbestos by area consistent with the definition of ACM in 40 CFR 61.141 and 40 CFR 763.83. A licensed contractor with workers accredited in accordance with the Asbestos Hazard Emergency Response Act (AHERA) was specified to perform all ACM removal work in accordance with the RA Health and Safety Plan. The ROD had listed the volume of ACM removal to be approximately 2 cubic yards of asbestos from the former furnace area and approximately 15 cubic yards of friable bulk ACM and asbestos-contaminated soils from six locations at the Site. The RD also specified that all non-friable ACM visible on the ground surface will be removed. Non-friable ACM includes materials such as gaskets, piping and rope which were identified during the RI/FS and the RD. The design for remediation of ACM was developed consistent with the ROD and is included in Volume 1 of the Remedial Design (RD) Report.

The RD also specified that confirmatory samples be taken at each ACM removal area and that the samples be analyzed for asbestos in accordance with the RA Sampling and Analysis Plan to confirm ACM clean-up. If the analytical results exceeded one percent asbestos, additional soil was excavated until the confirmatory sample results indicated less than one percent asbestos in the sample.

2.2 Removal Action

2.2.1 Removal of ACM as Specified in the RD

Southwest Hazard Control, Inc. (SHC), a licensed asbestos removal contractor with AHERA accredited asbestos workers, subcontracted with the RA Contractor to perform the ACM removal as specified by the RD. This work included: 1) enclosure of the former furnace and removal of friable ACM from the structure; 2) excavation of asbestos-contaminated soils from five designated locations and bulk friable asbestos from one designated location; and 3) removal of non-friable ACM from the ground surface at the Site. During on-site construction activities, representatives of ARCO/EPNG, including the SC/QAO, inspected ACM removal work to ensure that all work was performed in accordance with the approved plans.

SHC mobilized to the Site on May 17 and completed the removal of ACM from the furnace on May 20, 1995. A sealed enclosure encompassing the furnace was constructed for removal of ACM. The friable asbestos volume of 3.3 cubic yards was removed from the furnace structure, sealed in plastic, as shown in Figure 2-1, and placed in 12 drums.

FIGURE 2-1 - Friable Asbestos Removed From Furnace and Sealed in Plastic

The brick remaining at the furnace structure following removal of ACM, as shown Figure 2-2, was sampled and analyzed for ACM. The analysis results summarized in Table 2-1 confirmed that all ACM was removed from the furnace structure. Complete analytical results are provided in Appendix 2.2.

The five designated asbestos-contaminated soil locations (AA-2, AA-7, P-22, P-13, and AA-10) and the one designated friable asbestos location (A-19) were located by surveying and marked accordingly. The ACM removal from these six locations was completed on May 23, 1995. Due to the presence of surface and subsurface obstructions, not all of the excavations could be completed to the extent and depths designated by the RD Report. A total volume of friable asbestos and asbestos-contaminated soil of 12.3 cubic yards was excavated and placed in 45 drums, as shown in Figure 2-3. This included six drums (1.64 cubic yards) designated as hydrocarbon-contaminated ACM which was removed from areas where hydrocarbon staining was visible and one drum (0.27 cubic yards) designated as lead-contaminated ACM which was removed from within the delineated lead-contaminated soil at the Vertical Tank area. ACM in these seven drums were labeled accordingly and transported to the U.S. Ecology Hazardous Waste Facility in Beatty, Nevada for disposal. The remaining 38 drums of ACM (10.4 cubic yards) were transported to the Keers Environmental Special Waste Monofill in Mountainair, New Mexico.

FIGURE 2-2 - Furnace Structure Following Removal of ACM

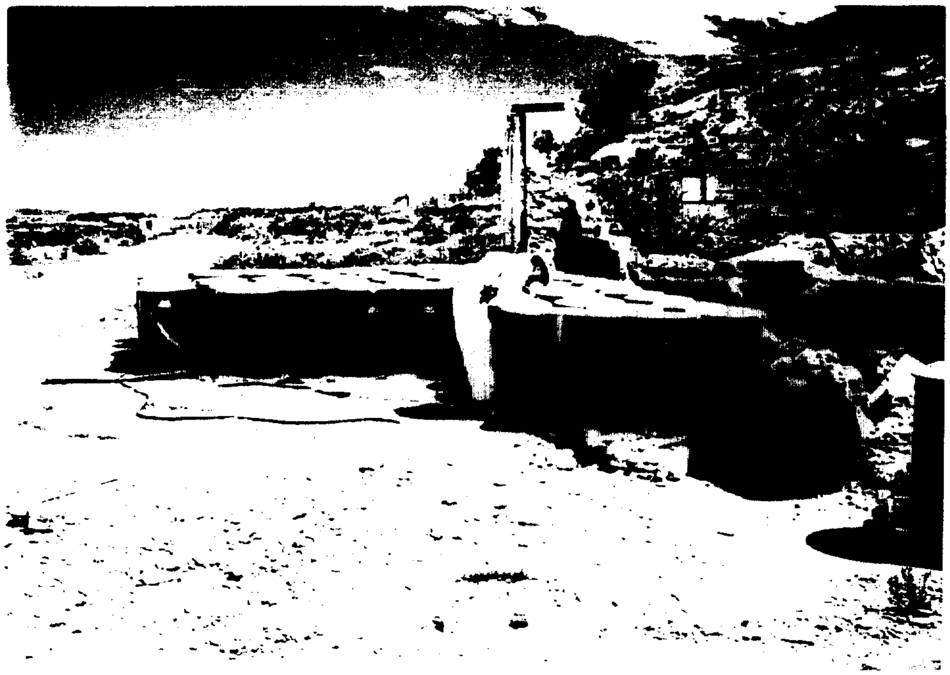

FIGURE 2-3 - Asbestos Removal Drums

2.2.2 Identification of Additional ACM

During the removal of ACM, it became apparent that ACM at the Site was far more extensive than indicated by the RI/FS or the RD Report. Furthermore, asbestos could not be identified at several of the five designated asbestos-contaminated soil locations but was found nearby. After completing the ACM removal from the former furnace and the six other locations designated in the RD, the RA Contractor assessed feasible and practical methods for removal of the additional ACM that was scattered throughout the process area. A vacuum technology was selected as the preferred method for controlling the volume of generated waste and for compliance with regulatory requirements. Following approval from ARCO and EPNG, and notification to the EPA, the RA Contractor retained Dominion Services Inc. (DSI) to remove the remaining friable and non-friable asbestos from the Site.

Because the additional ACM was scattered throughout the process area, a decision was made to establish a grid system for the entire fenced area of the Site. The RA Contractor established a location grid with 50 x 50 foot spacing with the corners located in the field and marked by flags that were labeled according to the designated row (letter) and column (number) as shown in Figure 2-4. This served two purposes:

1. It established a systematic method for traversing the entire Site in-order to pick up non-friable asbestos, and

2. During the traverse of the grids to pick up non friable ACM, friable ACM was identified, flagged, and located according to a surveyed grid so that non-friable ACM could be removed systematically.

2.2.3 Pick Up of Non-Friable ACM

DSI personnel conducted traverses at a spacing of five feet across, each of the 50 x 50 foot grid sections. All suspect non-friable ACM visible at the surface was picked up and suspected friable ACM discovered during the traverse was marked with red tape for later removal as shown in the photo in Figure 2-5. ACM was found in concrete foundations and under concrete structures as shown in Figure 2-6. Nine drums (2.45 cubic yards) of suspected non-friable ACM was picked up during the traverse of the grids and the subsequent confirmatory "walk through" of the grids by DSI and the SC/QAO. These nine drums of ACM were transported to the Keers Environmental Special Waste Monofill in Mountainair, New Mexico.

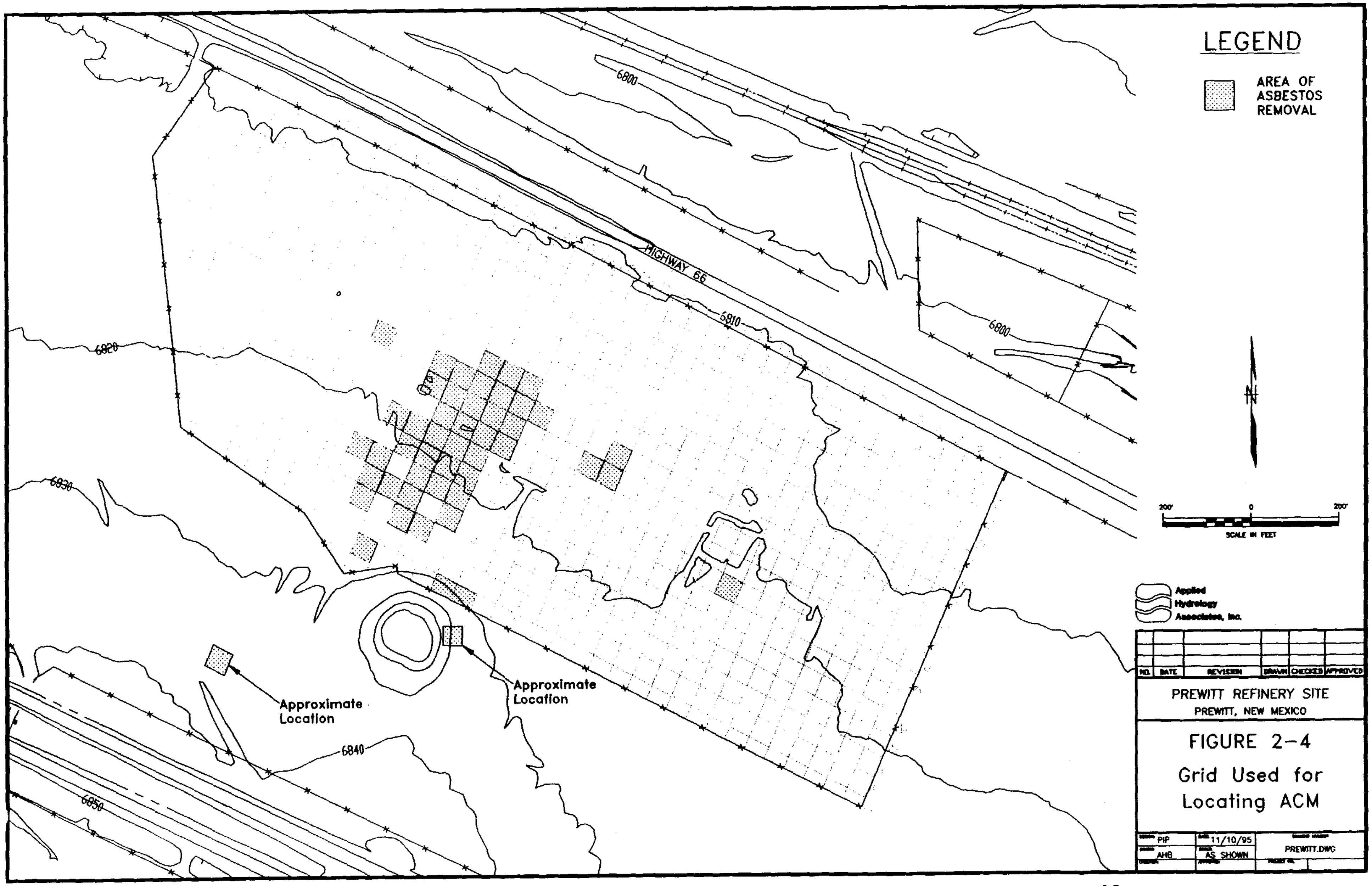

FIGURE 2-4
Grid Used for Locating ACM

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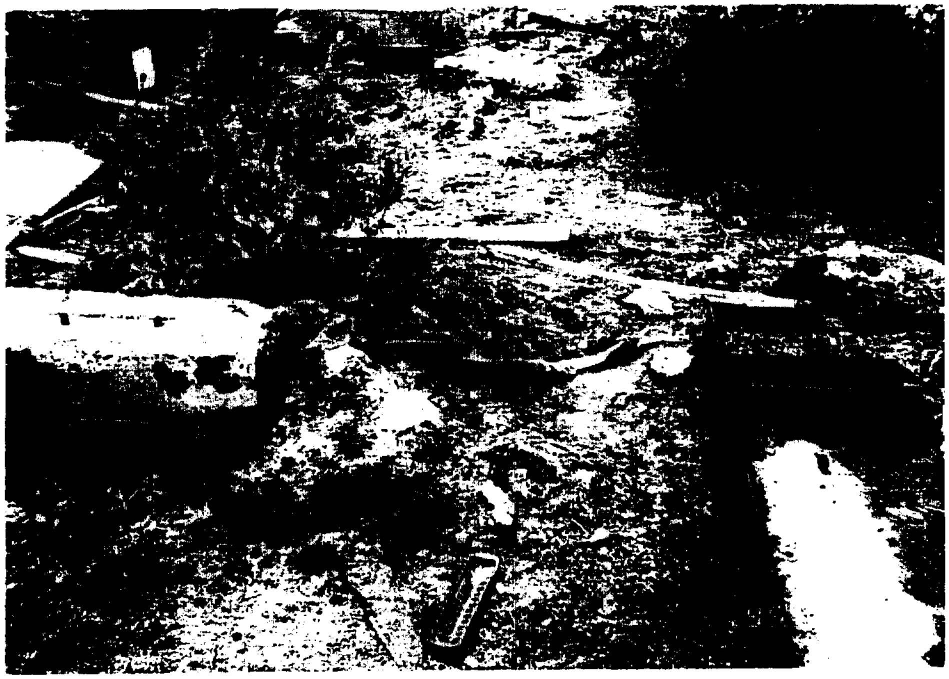

FIGURE 2-5 - Identified Suspect Friable ACM

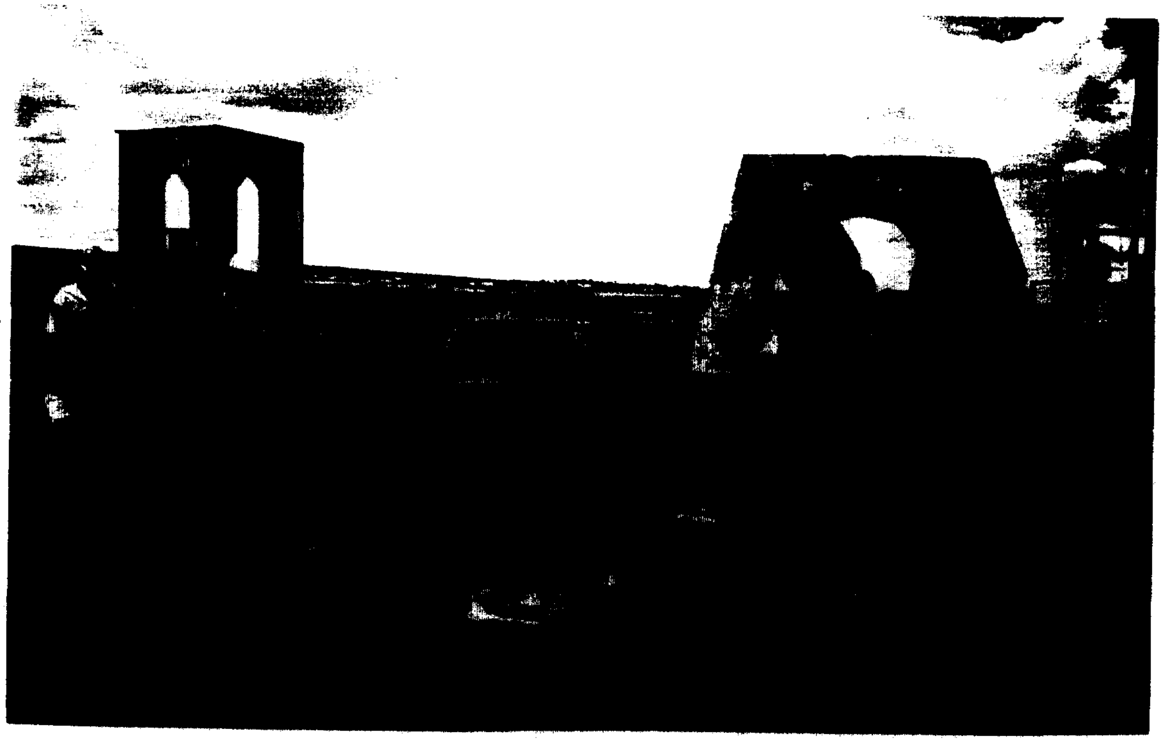

FIGURE 2-6 - ACM Found Beneath Concrete Structures

2.2.4 Remedial Action Sampling and Analysis Plan Addendum

An addendum to the RA SAP, which is included in Appendix 2.1, was developed to provide a definitive procedure for confirmatory sampling of ACM removal from the scattered locations. After the Addendum to the RA SAP was approved by the EPA, asbestos sampling and analysis was conducted in accordance with the RA SAP and the Addendum to confirm that the removal of ACM from the Site was completed in accordance with the ROD and the Order. The Addendum specified that composite confirmatory soil samples collected from approximately 1 cubic yard of soil would be obtained in all areas where ACM removal had taken place. At all removal locations where the analytical results indicated that the composite soil sample contained greater than 1% asbestos, additional removal was performed and confirmatory sampling and analysis was repeated following removal. When the analytical results indicated that the composite sample contained less than 1% asbestos, the ACM removal was deemed complete at that location.

2.2.5 Excavation of Additional ACM

An exclusion zone was established around the entire process area where suspected ACM was identified. Areas containing suspected friable ACM were sprayed with water before and during removal work to prevent air emissions. ACM was removed with a vacuum equipped with high efficiency particulate absolute (HEPA) filters.

The ACM removal was started with a small capacity vacuum as shown in Figure 2-7. The ACM was loaded directly into 55 gallon drums that were double lined with 6-mil plastic liners. This unit proved to be too limited for the task and was later replaced by a more powerful large capacity truck-mounted vacuum that loaded into large steel "roll-off" transportation bins (21' x 7.5' x 4') as shown in the photo in Figure 2-8. Approximately 7 cubic yards of ACM were removed with a small capacity vacuum and placed in 26 drums. The contents of these drums were subsequently transferred to a bladder in the roll-off bin using the large capacity vacuum.

FIGURE 2-7 - Small Capacity Vacuum

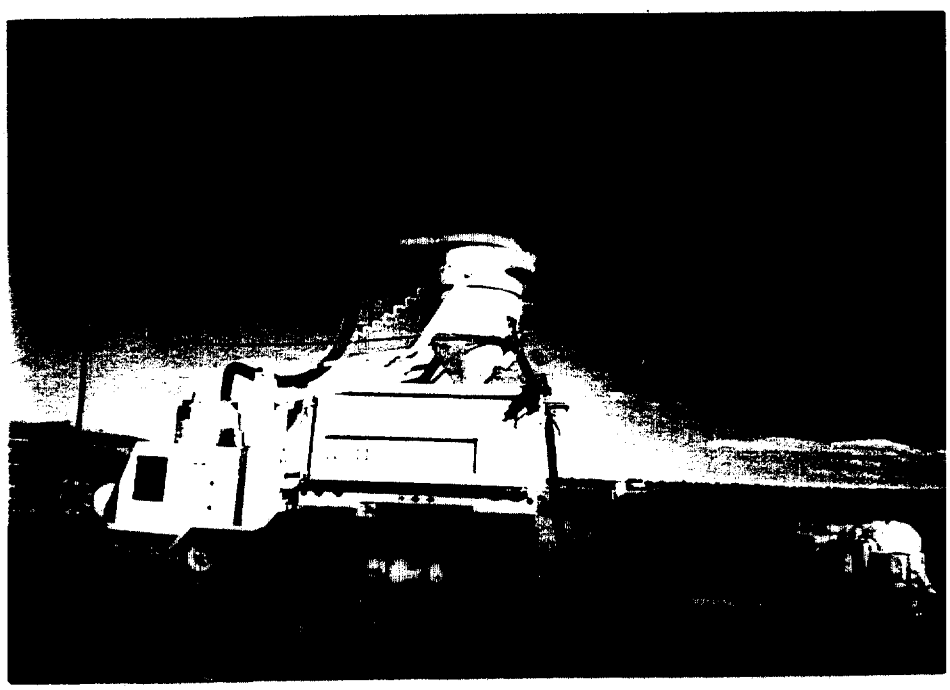

FIGURE 2-8 - Large Capacity Truck-Mounted Vacuum

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All ACM removed from locations with visible hydrocarbon staining was placed in separate bins designated for hydrocarbon contaminated ACM. Each "roll-off" transportation bin was equipped with a bladder with four openings along the top that could be attached to the outlet of the vacuum. After loading each bin, the RA Contractor and the SC/QAO measured the dimensions of the bladder to provide a volume for the waste manifest as shown in Figure 2-9.

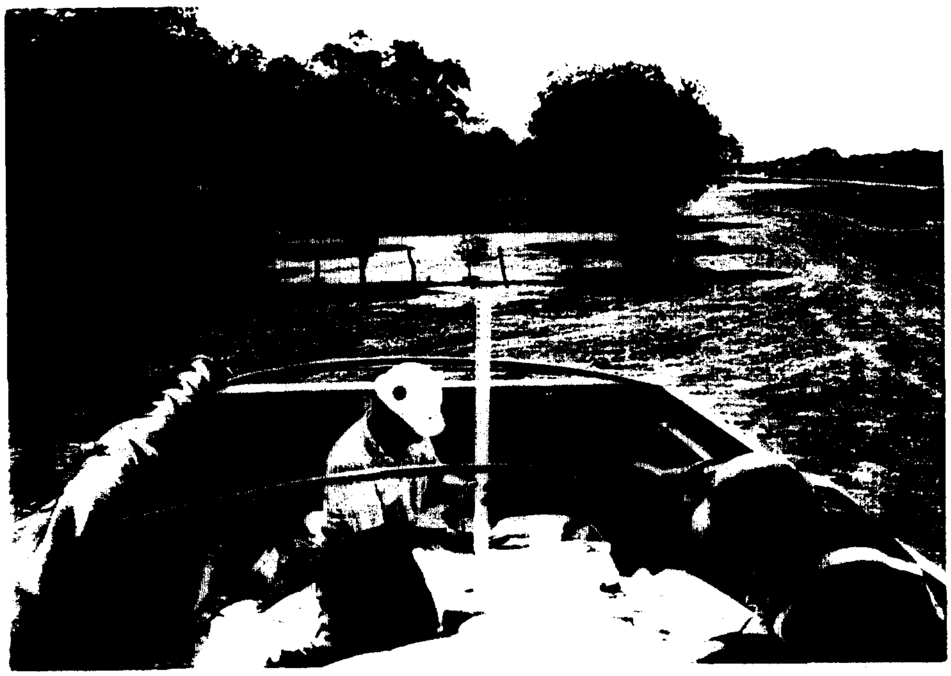

FIGURE 2-9 - SC/QAO Measurements for Waste Manifest

2.2.6 Additional Sampling and Review of ACM Removal Methods

The work was temporarily suspended in August 1995 to allow additional characterization of the remaining ACM at the Site and to resolve issues concerning ACM removal practices. The order to stop work was issued after the contractor removed soil from outside the area where ACM had been identified. The two transportation bins (Bin #605-52 and Bin #4) that had been filled with these materials were subsequently sampled and found to contain only trace asbestos using point count procedures with PLM (see Table 2-1). In contrast, a composite sample taken from Bin #3 showed 10 to 30 % asbestos. The laboratory reports for these samples are included in Appendix 2.2.

TABLE 2-1

Results of the Analysis of Samples from Asbestos Bins

Date	Bin Sample No.	Analytical Results (Percent Asbestos)	Lab Name
14-Aug-95	Bin #605-52*	Trace, <1%	Assagai
14-Aug-95	Bin #4*	Trace, <1%	Assagai
14-Aug-95	Bin #605-52	Trace, <1%	FRS Geotech
17-Aug-95	Bin 605-52R1	Trace, <1%	FRS Geotech
17-Aug-95	Bin 605-52R2	Trace, <1%	FRS Geotech
14-Aug-95	Bin #3	10-30	Assagai

*Point Count Analysis

On August 17, 1995, the asbestos removal contractor, DSI, collected several additional samples from Bin #605-52, taking three samples from shallow and deep within the bin. These samples were analyzed by FRS Geotech, Inc. using the PLM method and were also found to contain less than 1% asbestos. These results are also summarized in Table 2-1 and are included in Appendix 2.2. After discussing these results with the EPA, the EPA concurred that the contents of the bins (approximately 28 cubic yards) was not ACM and did not need to be removed from the Site.

At the time work was halted, a total volume of 165.32 cubic yards of ACM removed by DSI had been transported to the Keers Environmental Special Waste Monofill in Mountainair, New Mexico. Also, DSI had removed 87.8 cubic yards of hydrocarbon-contaminated ACM, which was subsequently transported to the U.S. Ecology Facility in Beatty, Nevada for disposal. The 28 cubic yards of non-ACM which was removed by DSI was subsequently placed in a low area on-site prior to backfilling.

When the work was temporarily suspended, the SC/QAO retained the services of an asbestos removal expert, Keers Environmental Services, to review the remaining suspected ACM locations at the site and the current removal practices involving hand tool excavation combined with vacuuming. Based on this review, Keers Environmental Services recommended the following:

- Sample the suspected ACM locations in advance of removal since not all substances which appear to be asbestos actually are asbestos.

- Use a small loader and hand tools for excavation with a water spray to control emissions. The previous excavation with hand tools, combined with vacuuming, was very time consuming and inefficient, especially for the asbestos embedded in hard packed soils (see photos in Figures 2-10 and 2-11).

- Remove approximately 3 inches of ACM and soil using the loader at the locations delineated by the on-site supervisor, based on the additional ACM sampling results.

- If the ACM excavation exposes significant visible ACM, perform additional excavation at the location as directed by the on-site supervisor until it is cleared for confirmatory sampling.

ACM sampling in advance of removal was performed at 21 locations. Based on these results (see Table 2-2), fifty four (54) ACM removal locations were numbered and delineated in the field as shown in the example photos included in Figure 2-12. Figure 2-13 shows the same location after removal of ACM.

FIGURE 2-10 - Hand Tool Excavation

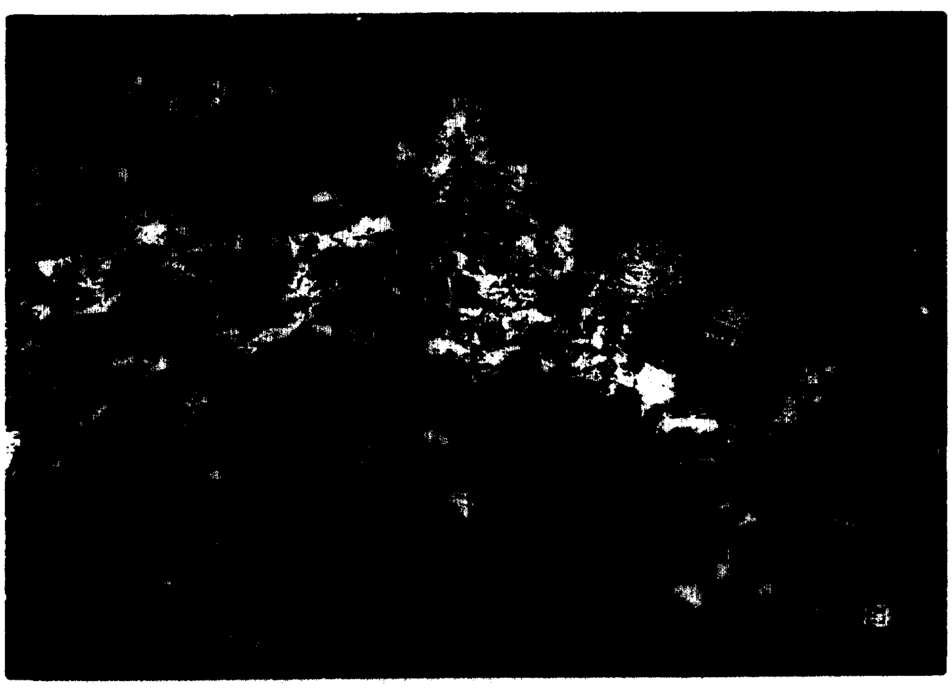

FIGURE 2-11 - Hard Packed Asbestos Soils

TABLE 2-2

Prewitt Asbestos Analysis Results - Sampling in Advance of Removal

August 1995

Sampling Date	Sample Number	Analytical Results (Percent Asbestos)	Lab Name
4-Aug-95	RMG A1	ND	Assagai
4-Aug-95	RMG A2	30-50	Assagai
14-Aug-95	RMG-A1	>75	Assagai
14-Aug-95	RMG-A2	35-60	Assagai
14-Aug-95	RMG-A3	ND	Assagai
14-Aug-95	RMG-A4	10-20	Assagai
14-Aug-95	RMG-A5	10-30	Assagai
15-Aug-95	RMG-AA	55-85	Assagai
17-Aug-95	H26A-1D	6	FRS Geotech
17-Aug-95	H29A-1D	4	FRS Geotech
17-Aug-95	I18A-1D	2	FRS Geotech
17-Aug-95	I26A-1D	4	FRS Geotech
17-Aug-95	I26A-2D	4	FRS Geotech
17-Aug-95	K27A-1D	3	FRS Geotech
17-Aug-95	L23A-1D	2	FRS Geotech
17-Aug-95	N27A-1D	4	FRS Geotech
17-Aug-95	N27A-2D	4	FRS Geotech
17-Aug-95	O27A-1D	5	FRS Geotech
17-Aug-95	Q26A-1D	2	FRS Geotech
23-Aug-95	E21A-1D	10-30	Assagai
23-Aug-95	G24A-1D	31-55	Assagai

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FIGURE 2-12 - ACM Removal Location Marked in Advance

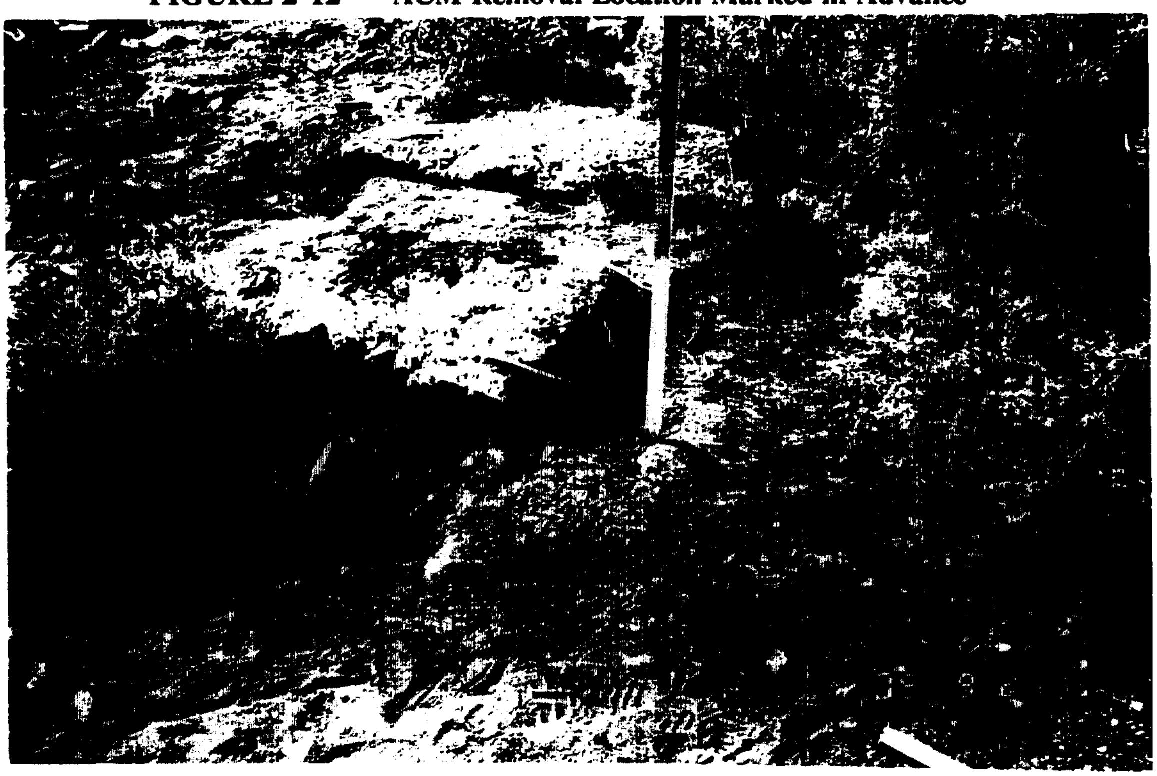

FIGURE 2-13 - ACM Location After ACM Removal

2.2.7 Completion of ACM Removal

The ACM removal work resumed on September 20, 1995, after Keers Environmental was subcontracted to complete the asbestos removal work. The area was wetted down prior to removal to prevent air emissions. The material containing bulk friable asbestos was removed using a backhoe with hand tools. Additional water was applied during removal to prevent visible emissions.

A total volume of 106.28 cubic yards of ACM was removed by Keers and transported to the Keers Environmental Special Waste Monofill in Mountainair, New Mexico. Also, Keers removed 1.36 cubic yards of hydrocarbon-contaminated ACM, which was subsequently transported to the U.S. Ecology Facility in Beatty, Nevada for disposal. Confirmatory sampling was performed after each removal location was cleared by the SC/QAO. The ACM removal work was completed on October 3, 1995.

2.3 ACM Waste Transportation and Disposal

2.3.1 ACM Waste Characterization and Profiling

Asbestos removed from the Site during remedial action was transported to two different disposal facilities depending upon the characteristics of the ACM waste and the acceptance criteria required by the facility. The majority of the ACM (286 cubic yards) was classified as "RQ Asbestos, Hazard Class 9" and was transported by licensed waste transporters to the Keers Environmental Special Waste Monofill in Mountainair, New Mexico. As part of the waste profile performed for this material, the disposal facility requested that samples from the soil removal locations be taken and analyzed for leachable lead using the Toxicity Characteristic Leaching Procedure (TCLP). The results of these tests were well below the acceptance criteria and did not restrict the acceptance of the waste (see Appendix 2.3).

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Some ACM removal locations also contained visible hydrocarbon contamination either as dark hydrocarbon-stained soil or as a viscous tar-like liquid. The ACM removed from these locations was segregated as hydrocarbon-contaminated ACM waste. This quantity of ACM (91 cubic yards) either exceeded the acceptance criteria of 1,000 ppm for total petroleum hydrocarbon (TPH) defined by the Keers Environmental Special Waste Monofill facility or was assumed to exceed the criteria based on visual inspection. Also, a small quantity of friable asbestos (0.27 cubic yards) was removed from within the Vertical Tanks area where soil lead concentrations had been characterized as greater than 500 ppm. Since the ACM was excavated from an area that contained soils with elevated concentrations of lead, this waste was sent to the US Ecology Facility in Beatty, Nevada, which could accept lead-contaminated ACM wastes. Waste characterization profiles for all asbestos related waste shipments are included in Appendix 2.3.

2.3.2 ACM Waste Manifesting, Transportation, and Disposal

After the appropriate classification was established for wastes accumulated for off-site disposal, a manifest for shipment of that waste to the selected commercial waste disposal facility was prepared. The volume of ACM was measured by the SC/QAO or ARCO/EPNG and the waste manifest was signed by an authorized employee or representative of ARCO/EPNG as generator.

Manifests for ACM were prepared in accordance with Appendix D of 40 CFR 763, Subpart E. The ACM waste was inspected by the transporter and an authorized employee or representative of ARCO or EPNG. Prior to allowing the removal of the ACM waste from the Site, the authorized employee or representative obtained the signature of the initial transporter and date of acceptance on the manifest which stated that the waste had been inspected and the waste was properly wetted and containerized. One copy of the manifest was retained at the time of shipment and an additional copy was provided by the permitted disposal facility upon receipt of the waste. Manifests for all asbestos related waste shipments are included in Appendix 2.4 and are summarized in Table 2-3.

TABLE 2-3

Summary of ACM Waste Manifests

Month	Type of ACM Waste	Removal Contractor	Disposal Facility	No. of Shipments	Total Volume (cubic yards)
June, 1995	Friable ACM	Dominion Services Inc.	Keers Monofill	4	64.27
July, 1995	Friable ACM	Dominion Services Inc.	Keers Monofill	6	101.05
July, 1995	Friable ACM	SW Hazard Control	Keers Monofill	1	14.43
July, 1995	Hydrocarbon and Lead Cont. ACM	SW Hazard Control	U.S. Ecology, Beatty, Nevada	1	1.91
July, 1995	Non-Friable ACM	Dominion Services Inc.	Keers Monofill	1	2.45
August, 1995	Hydrocarbon Cont. ACM	Dominion Services Inc.	U.S. Ecology, Beatty, Nevada	2	32.9
Sept., 1995	Hydrocarbon Cont. ACM	Dominion Services Inc.	U.S. Ecology, Beatty, Nevada	3	51.13
Sept., 1995	Friable ACM	Keers Env. Services	Keers Monofill	3	69.6
Oct., 1995	Friable ACM	Keers Env. Services	Keers Monofill	2	41.68
Oct., 1995	Hydrocarbon Cont. ACM	Keers Env. Services	U.S. Ecology, Beatty, Nevada	1	1.36
Nov., 1995	Hydrocarbon Cont. ACM	Dominion Services Inc.	U.S. Ecology, Beatty, Nevada	1	4

2.4 Health, Safety, and Regulatory Compliance

The remedial action work was implemented in accordance with the RA Health and Safety Plan (HASP). Access to the asbestos exclusion zone was restricted to qualified workers and oversight personnel during asbestos removal. All personnel working on-site had current OSHA training in conformance with 29 CFR 1910-120 and all personnel working within the asbestos removal exclusion area had current AHERA training. All personnel working on-site were also required to participate in Site Health and Safety training before starting work at the Site and to participate in daily health and safety meetings. All asbestos remedial action work was completed with no injuries or incidents of health and safety concern.

Decontamination water was contained, filtered and re-used. Air monitoring was performed during all asbestos removal activities in accordance with 40 CFR 61 Subpart M. Air monitoring results are provided in Appendix 2.5. Copies of notifications required by the National Emission Standard for Asbestos in 40 CFR 61 Subpart M are also provided in Appendix 2.5.

2.5 Confirmatory Sampling

Once removal work was completed in a contiguous removal area and no asbestos was visible within the excavated area, the SC/QAO collected confirmatory soil samples. The grid locations where ACM removal was conducted are shown in Figure 2-4.

In accordance with the RA SAP Addendum, the number of confirmatory samples collected from each area was determined by the percentage of the 50 x 50 foot square in which ACM removal work was done. Each soil sample consisted of a five-point composite that was obtained using a 1-inch diameter sampling tube driven to 3 inches below the excavated surface, as shown in Figure 2-14. Pin flags were used to designate the center point of each composite.

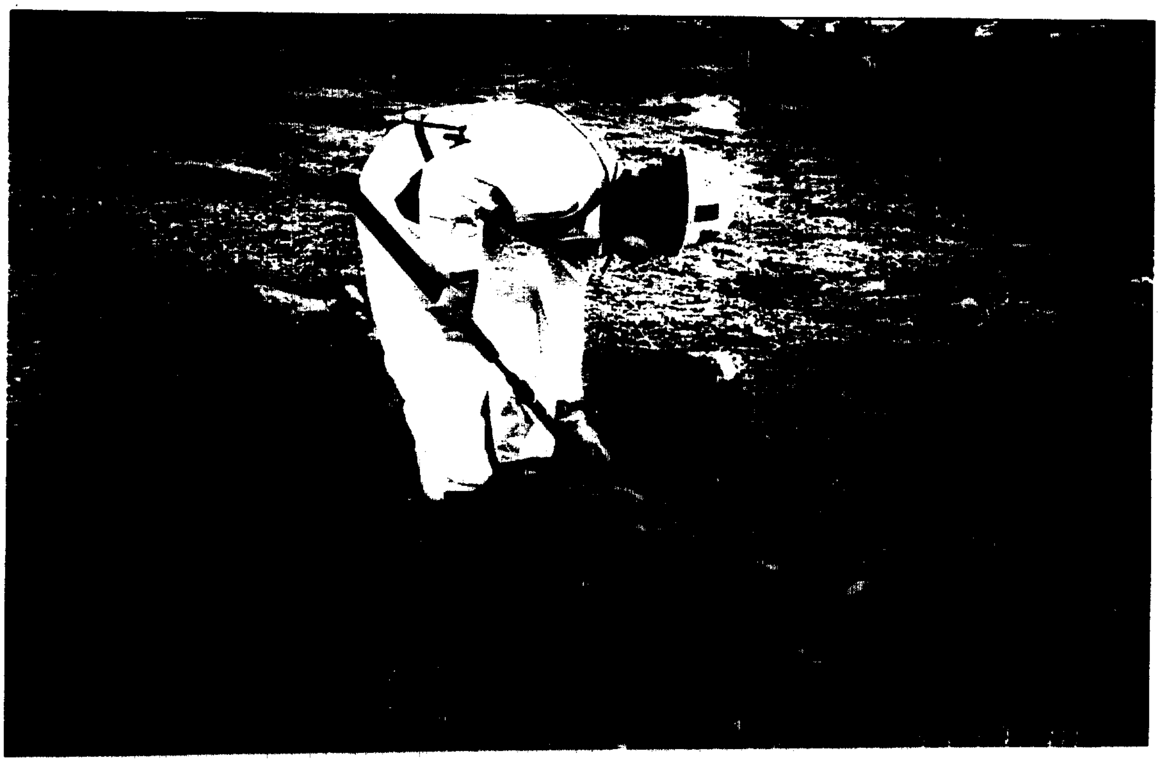


FIGURE 2-14 - Confirmatory Sampling of ACM Removal Location

Samples were labeled, sealed in recloseable plastic bags, and shipped to a certified laboratory for analysis. Confirmatory samples were labeled according to grid location as described in the Addendum to the RA SAP. Samples were analyzed for asbestos content by polarized light microscopy (PLM) in accordance with the RA SAP. In a few cases where the visual detection range by estimation with polarized light microscopy was too large (i.e., 1% to 5%), the sample was reanalyzed by performing a point count, a more accurate PLM method, of the prepared sample slide.

The analytical results were then used to determine if attainment of the clean-up criteria had been achieved at the removal location. Additional excavation was done at all locations where confirmatory samples indicated asbestos greater than one percent. In some cases several rounds of confirmatory sampling and removal work were required to meet the clean-up criteria. ACM confirmatory sampling analytical results are included in Appendix 2.2 and are summarized in Table 2-4.

TABLE 2-4

Summary of Asbestos Confirmatory Sampling Results

	Initial Results		Resample #1		Resample #2	
Sample Designation	**Sampling Date**	**% Asbestos**	**Sampling Date**	**% Asbestos**	**Sampling Date**	**% Asbestos**
Furnace Brick	15-Aug-95	ND				
G22A-1	17-Aug-95	Trace, <1%				
G22A-1	26-Sep-95	Trace, <1%				
G23A-1	15-Aug-95	1-5	26-Sep-95	Trace, <1%		
G23A-2	15-Aug-95	1-5	25-Sep-95	2.25	See Footnote*	See Footnote*
G23A-3	25-Sep-95	Trace, <1%				
G23A-4	25-Sep-95	Trace, <1%				
G23A-5	25-Sep-95	Trace, <1%				
G24A-1	25-Sep-95	Trace, <1%				
H17A-1	5-Jun-95	ND				
H17A-2	5-Jun-95	ND				
H21A-1	1-Aug-95	ND				
H21A-2	1-Aug-95	Trace, <1%				
H21A-3	14-Aug-95	Trace, <1%				
H22A-1	14-Aug-95	1-5	26-Sep-95	Trace, <1%		
H22A-1	14-Aug-95	Trace, <1%				
H22A-2	14-Aug-95	Trace, <1%				
H22A-3	14-Aug-95	1-5	26-Sep-95	Trace, <1%		
H22A-3	14-Aug-95	Trace, <1%				
H22A-4	14-Aug-95	Trace, <1%				

ND = Not Detected

* - Samples G23A-2 and K24A-Tar Pit were obtained from concrete-lined sumps. No subsequent soil samples were obtained because all of the material was removed.

TABLE 2-4 (Continued)

Summary of Asbestos Confirmatory Sampling Results

	Initial Results		Resample #1		Resample #2	
Sample Designation	**Sampling Date**	**% Asbestos**	**Sampling Date**	**% Asbestos**	**Sampling Date**	**% Asbestos**
H23A-1	15-Aug-95	1-5	26-Sep-95	Trace, <1%		
H23A-2	15-Aug-95	1-5	26-Sep-95	Trace, <1%		
H24A-1	22-Sep-95	Trace, <1%				
H24A-2	22-Sep-95	Trace, <1%				
H24A-3	25-Sep-95	Trace, <1%				
H24A-4	25-Sep-95	Trace, <1%				
H25A-1	25-Sep-95	Trace, <1%				
H26A-1	26-Sep-95	Trace, <1%				
H29A-1	27-Sep-95	Trace, <1%				
I17A-1	5-Jun-95	Trace, <1%				
I17A-2	5-Jun-95	Trace, <1%				
I18A-1	27-Sep-95	Trace, <1%				
I22A-1	1-Aug-95	Trace, <1%				
I22A-2	1-Aug-95	Trace, <1%				
I22A-3	1-Aug-95	Trace, <1%				
I23A-1	26-Sep-95	Trace, <1%				
I24A-1	21-Sep-95	Trace, <1%				
I24A-2	2-Oct-95	Trace, <1%				
I25A-1	22-Sep-95	Trace, <1%				
I25A-2	22-Sep-95	Trace, <1%				

TABLE 2-4 (Continued)

Summary of Asbestos Confirmatory Sampling Results

	Initial Results		Resample #1		Resample #2	
Sample Designation	Sampling Date	% Asbestos	Sampling Date	% Asbestos	Sampling Date	% Asbestos
I26A-1	17-Aug-95	Trace, <1%				
I26A-2	17-Aug-95	Trace, <1%				
I26A-3	17-Aug-95	Trace, <1%	26-Sep-95*	1.75*	2-Oct-95*	Trace, <1%*
I26A-4	26-Sep-95	Trace, <1%				
J22A-1	18-Jul-95	Trace, <1%				
J22A-2	18-Jul-95	Trace, <1%				
J22A-3	18-Jul-95	2	22-Sep-95	Trace, <1%		
J22A-4	14-Aug-95	1-5	22-Sep-95	Trace, <1%		
J22A-4	14-Aug-95	Trace, <1%				
J22A-5	22-Sep-95	Trace, <1%				
J23A-1	18-Jul-95	2	22-Sep-95	1.0	27-Sep-95	Trace, <1%
J23A-2	18-Jul-95	4	22-Sep-95	Trace, <1%		
J23A-3	18-Jul-95	2	22-Sep-95	Trace, <1%		
J23A-4	18-Jul-95	2	22-Sep-95	Trace, <1%		
J24A-1	18-Jul-95	2	15-Aug-95	1-5	21-Sep-95	Trace, <1%
J24A-2	18-Jul-95	3	21-Sep-95	Trace, <1%		
J24A-3	18-Jul-95	4	21-Sep-95	Trace, <1%		
J24A-4	18-Jul-95	2	22-Sep-95	Trace, <1%		
J24A-5	21-Sep-95	Trace, <1%				

* - Samples from I26A-3 were mislabeled as I26A-1 during resampling.

TABLE 2-4 (Continued)

Summary of Asbestos Confirmatory Sampling Results

	Initial Results		Resample #1		Resample #2	
Sample Designation	Sampling Date	% Asbestos	Sampling Date	% Asbestos	Sampling Date	% Asbestos
J25A-1	21-Sep-95	Trace, <1%				
J25A-2	21-Sep-95	Trace, <1%				
J25A-3	25-Sep-95	Trace, <1%				
J25A-4	25-Sep-95	2.25	2-Oct-95	Trace, <1%		
K10A-1	27-Sep-95	Trace, <1%				
K23A-1	18-Jul-95	Trace, <1%				
K23A-2	18-Jul-95	ND				
K23A-3	18-Jul-95	Trace, <1%				
K24A-1	12-Jul-95	2	21-Sep-95	Trace, <1%		
K24A-2	12-Jul-95	5	21-Sep-95	Trace, <1%		
K24A-3	12-Jul-95	ND				
K24A-4	21-Sep-95	Trace, <1%				
K24A-5	21-Sep-95	Trace, <1%				
K24A-Tar Pit	15-Aug-95	1-5	See Footnote*	See Footnote*		
K25A-1	11-Jul-95	Trace, <1%				
K25A-2	11-Jul-95	2	21-Sep-95	Trace, <1%		
K25A-3	11-Jul-95	ND				
K25A-4	11-Jul-95	ND				
K25A-5	21-Sep-95	Trace, <1%				
K25A-5	21-Sep-95	Trace, <1%				

ND = Not Detected

* - Samples G23A-2 and K24A-Tar Pit were obtained from concrete-lined sumps. No subsequent soil samples were obtained because all of the material was removed.

TABLE 2-4 (Continued)

Summary of Asbestos Confirmatory Sampling Results

	Initial Results		Resample #1		Resample #2	
Sample Designation	**Sampling Date**	**% Asbestos**	**Sampling Date**	**% Asbestos**	**Sampling Date**	**% Asbestos**
K26A-1	11-Jul-95	Trace, <1%				
K26A-2	11-Jul-95	4	21-Sep-95	Trace, <1%		
K26A-3	11-Jul-95	3	21-Sep-95	Trace, <1%		
K26A-4	26-Sep-95	3.75	2-Oct-95	Trace, <1%		
K27A-1	27-Sep-95	Trace, <1%				
L23A-1	12-Jul-95	Trace, <1%	21-Sep-95	Trace, <1%		
L24A-1	12-Jul-95	Trace, <1%				
L24A-2	12-Jul-95	ND				
L24A-3	12-Jul-95	Trace, <1%				
L24A-4	21-Sep-95	Trace, <1%				
L25A-1	11-Jul-95	ND				
L25A-2	11-Jul-95	2	21-Sep-95	Trace, <1%		
L25A-3	11-Jul-95	Trace, <1%				
L25A-4	21-Sep-95	Trace, <1%				
L25A-5	21-Sep-95	Trace, <1%				
L26A-1	11-Jul-95	Trace, <1%				
L26A-2	11-Jul-95	2	21-Sep-95	Trace, <1%		
M23A-1	21-Sep-95	Trace, <1%				
M24A-1	12-Jul-95	Trace, <1%				
M24A-2	12-Jul-95	Trace, <1%				

ND = Not Detected

TABLE 2-4 (Continued)

Summary of Asbestos Confirmatory Sampling Results

Sample Designation	Initial Results		Resample #1		Resample #2	
	Sampling Date	% Asbestos	Sampling Date	% Asbestos	Sampling Date	% Asbestos
M25A-1	19-Jun-95	ND				
M25A-2	19-Jun-95	ND				
M25A-3	19-Jun-95	2	18-Jul-95	Trace, <1%		
M25A-4	19-Jun-95	Trace, <1%				
M27A-1	19-Jun-95	Trace, <1%				
M27A-1	26-Sep-95	Trace, <1%				
M28A-1	2-Oct-95	Trace, <1%				
M28A-2	2-Oct-95	Trace, <1%				
N23A-1	21-Sep-95	Trace, <1%				
N25A-1	19-Jun-95	5	18-Jul-95	Trace, <1%		
N25A-2	19-Jun-95	ND				
N25A-3	19-Jun-95	Trace, <1%				
N25A-4	19-Jun-95	Trace, <1%				
N26A-1	19-Jun-95	Trace, <1%				
N26A-2	19-Jun-95	Trace, <1%				
N27A-1	27-Sep-95	Trace, <1%				
N27A-2	27-Sep-95	Trace, <1%				

ND = Not Detected

TABLE 2-4 (Continued)

Summary of Asbestos Confirmatory Sampling Results

	Initial Results		Resample #1		Resample #2	
Sample Designation	**Sampling Date**	**% Asbestos**	**Sampling Date**	**% Asbestos**	**Sampling Date**	**% Asbestos**
O24A-1	19-Jun-95	ND				
O24A-2	19-Jun-95	ND				
O25A-1	19-Jun-95	Trace, <1%				
O25A-2	19-Jun-95	ND				
O27A-1	27-Sep-95	Trace, <1%				
OSFA-1	2-Oct-95	Trace, <1%				
OSFA-2	2-Oct-95	Trace, <1%				
OSFA-3	2-Oct-95	Trace, <1%				
OSFA-4	2-Oct-95	Trace, <1%				
OSFA-5	2-Oct-95	Trace, <1%				
Q21A-1	19-Jun-95	ND				
Q22A-1	11-Jul-95	ND				
Q26A-1	27-Sep-95	Trace, <1%				

ND = Not Detected

2.6 Backfill, Grading and Revegetation

The RD specified that all excavations greater than 6 inches deep will be backfilled with clean fill. Backfilling and grading of the excavations of asbestos soil was completed following debris removal. All excavations were backfilled with clean fill taken from the excavation of a diversion constructed during closure of a historic landfill located immediately west of the Site. Samples of soils from the diversion area were analyzed for total lead and hydrocarbons in accordance with the RD prior to transport to the Site. The sample results provided in Appendix 2.6 showed that the fill material did not exceed any of the clean-up criteria at the Site.

Backfill soils were hauled to the Site by scrapers as shown in Figure 2-15, and distributed over the excavated and disturbed areas. The Site was then graded and compacted with dozers as shown in Figure 2-16. Following grading, the area was fertilized and disked to reduce compaction and to incorporate the fertilizer into the subsurface as shown in Figure 2-17. The disked area was then seeded in accordance with the RD using conventional drilling methods. Straw mulch was applied after seeding.

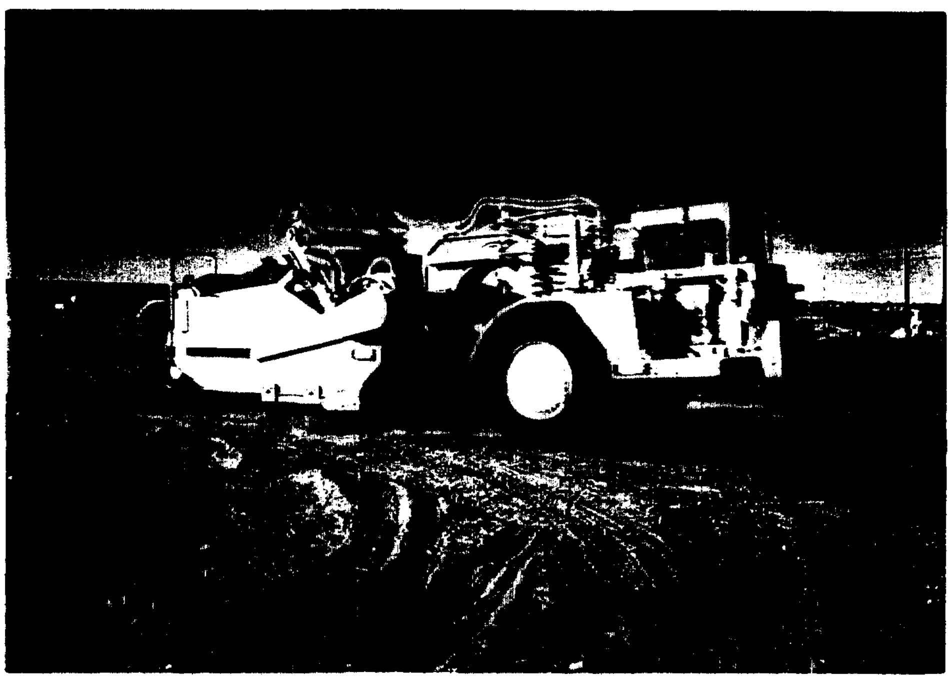


FIGURE 2-15 - Hauling of Backfill Soils

FIGURE 2-16 - Grading and Compacting

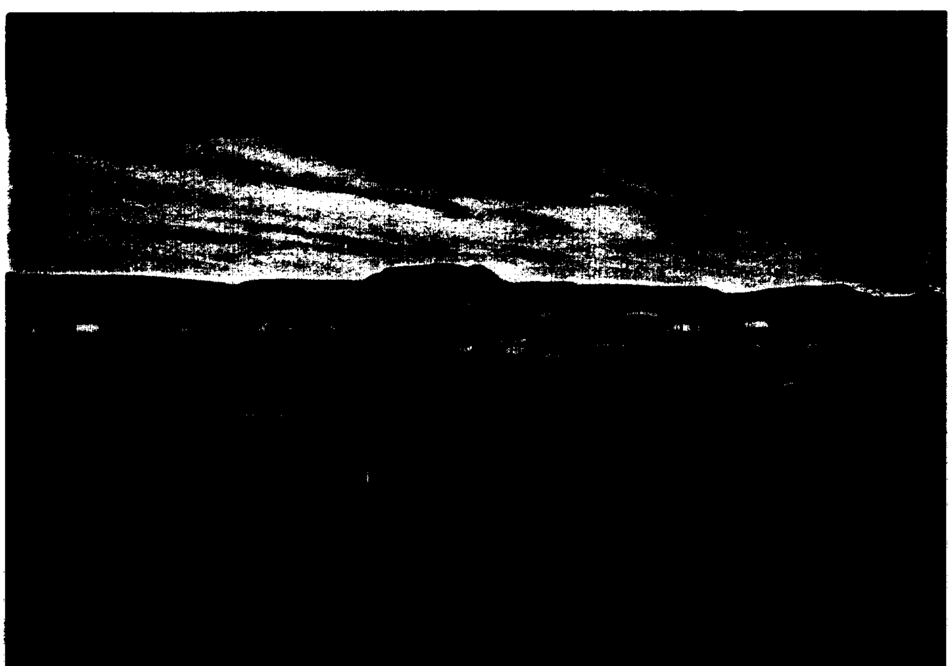


FIGURE 2-17 - Disking Prior to Revegetation

3.0 IMPLEMENTATION OF LEAD-CONTAMINATED SOIL REMEDIAL ACTION

The Remedial Action for Lead-Contaminated Soil was implemented in accordance with the RD, the RA Work Plan, and the Order to control or eliminate human exposure to lead-contaminated soils at the Site. This chapter describes the removal action, summarizes the nature and quantity of lead-contaminated soil removed from the Site, provides the names and locations of the disposal facilities which received the lead-contaminated soil, and provides the results of delineation sampling and confirmatory sampling.

The lead-contaminated soil was excavated, treated and disposed of according to the ROD and the excavated areas have been backfilled. Although the volume of lead-contaminated soil in the ROD was estimated to be approximately 1,900 cubic yards, a total of 2,733 cubic yards (3,830 tons) of lead-contaminated soil was excavated and transported off-site for disposal during implementation of the lead-contaminated soil remedial action. Lead-contaminated soil removed from the Site was transported to two different disposal facilities. The designated facility was determined based upon the lead concentrations determined by the toxicity characteristic leaching procedure (TCLP) and the concentrations of total petroleum hydrocarbons in the lead-contaminated soil. A total quantity of 1,503 tons of non-hazardous lead-contaminated soil was removed from the Site and transported to the Waste Management landfill facility in Rio Rancho, New Mexico. In addition, a total of 2,182 tons of hazardous lead-contaminated soil and 145 tons of non-hazardous lead-contaminated soils (with hydrocarbon concentrations that exceeded the acceptance criteria for the Waste Management facility) were removed and transported to the U.S. Ecology landfill facility in Beatty, Nevada.

3.1 Remedial Design Requirements

As stated in the Volume 1 of the Remedial Design Report, the scope of work to meet the remedial objectives for the clean-up of lead-contaminated soils included the following tasks:

- Locate the starting point for the sampling grid layout in each area of contaminated soil;
- Refine the delineation of the four areas of lead-contaminated soils that had been defined in the Remedial Investigation (RI);
- Excavate and stockpile the lead-contaminated soils and segregate soils containing visible hydrocarbon staining;
- Perform post-excavation confirmatory sampling of the open excavation to verify the removal of the lead-contaminated soils;
- Collect composite samples of the stockpiled soil for analysis to determine if the material meets transport and disposal requirements for lead toxicity under RCRA;
- Manifest, transport and dispose of lead-contaminated soils at permitted landfills based on the TCLP-lead analysis results; and
- Backfill excavated areas with clean soil.

This Remedial Action Completion Report for Lead-Contaminated Soil provides documentation of satisfactory completion of the remedial action in accordance with the Remedial Design and the Order. The report documents all of the activities and results associated with the remediation of lead-contaminated soil at the Site. These activities are discussed in the subsequent sections.

3.2 Delineation of Lead-Contaminated Soils

The four areas of lead soil contamination identified in the RD were determined from samples collected during the RI. Since the RI sampling was not adequate to define the aerial extent of lead-contaminated soils, the RD specified that additional sampling be performed to establish the boundaries of lead-contaminated soil for each of the four areas. A delineation sampling grid was established at each location in accordance with the RD. The sampling locations were established in a hexagonal grid at 30 foot increments and 120 degrees radially from the point of the highest detected lead concentration determined from the RI. The original grids of the four areas of suspected lead-contamination were provided in Volume 1 of the RD.

Preparation for soil sampling and analysis for delineation of lead excavation was started on May 1, 1995. Sampling and QA/QC procedures were refined to suit field conditions and sample preparation procedures. QA/QC procedures for sampling and X-Ray Fluorescence (XRF) analytical procedures were clarified. Refinements and clarifications of procedures were reviewed with EPA oversight personnel. A Memorandum to File was prepared and submitted to EPA in order to document these procedures developed during initial delineation sampling. This memorandum is included in Appendix 3.1.

3.2.1 Lead Delineation Sampling

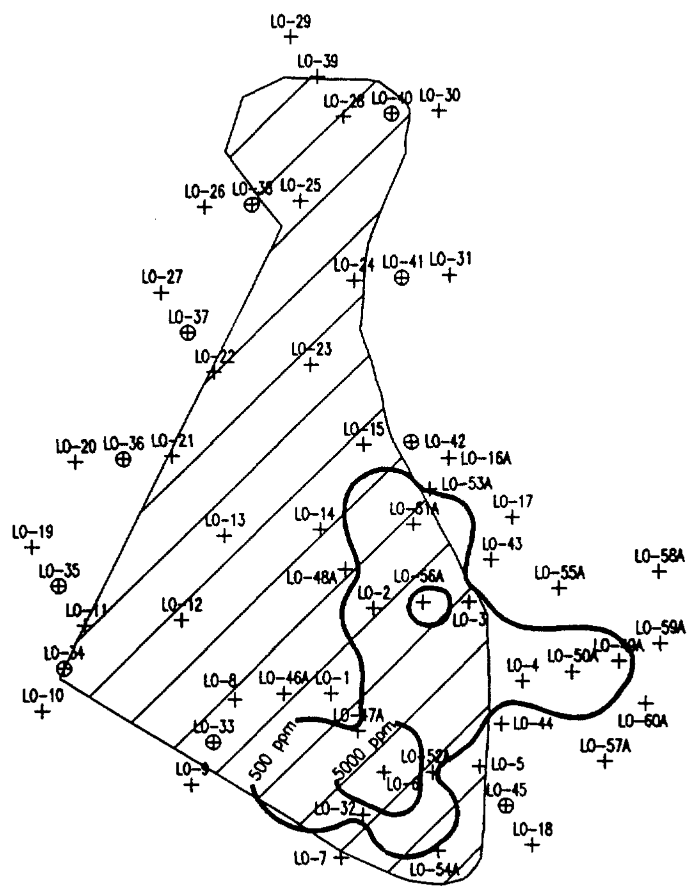
The location of the highest detected lead concentration in each of the four lead-contaminated soil areas identified in the RI, and the hexagonal grid sampling points as designated in the RD report were surveyed and staked prior to sampling. In each of the four lead soil areas, there were sampling points in the original grid that could not be sampled due to the presence of surface exposures of bedrock, concrete footings or other obstructions. In these cases, the original sampling point location was moved to the closest location where a sample could be taken. These sample locations that were adjusted from their original locations were designated with an "A" after the sample location (i.e. LT-25A). In a few cases, where the sampling expanded beyond the original grid before surveying could be arranged, new sampling points were established with a measuring tape and sampled before they were surveyed. Due to these modifications of sample point locations, the geometry of the sampling grids became asymmetrical in some areas.

When the results of the initial sampling points proved insufficient to define the extent of the lead soil contamination, new points were surveyed and staked by extending the geometry of the original grid. New sampling locations were established at 30 foot increments and 120 degrees radially from points in the original grid in accordance with the RA Sampling and Analysis Plan. Once a perimeter was established with lead concentrations less than the ROD clean-up level of 500 ppm, secondary samples were collected at points half the distance between the uncontaminated perimeter location and the adjacent contaminated location.

The initial grid was expanded to delineate the extent of lead-contamination soil in the office area, the separator area, and the vertical tank area. In the product area, no lead soil concentrations were found in excess of the 500 ppm clean up level at any of the RD sample grid locations. The final lead delineation sample grids of the office, separator, vertical tank and product lead soil areas contamination are shown in Figures 3-1, 3-2, 3-3, and 3-4, respectively. The aerial extent of lead-contaminated soil (greater than 500 ppm and where present greater than 5000 ppm) is delineated on these figures. The extent of lead-contaminated soil increased relative to that indicated in the RD in the separator area and the vertical tank area and decreased relative to that indicated in the RD in the office area.

Sampling equipment was decontaminated between samples following procedures outlined in the RD and later modified through correspondence with the EPA (see Appendix 3.1). Rinse blanks were obtained from the cleaned equipment to document that samples were not contaminated by the sampling equipment. Rinse blank analytical results are provided in Appendix 3.2.

001843



50' 0 50'
SCALE IN FEET

LEGEND

+ Surveyed Sample Location

⊕ Intermediate Location Not Sampled

RI Defined Extent of Lead Contaminated Soil > 500 ppm

Actual Extent of Lead Contaminated Soil > 500 ppm

Applied Hydrology Associates, Inc.

NO.	DATE	REVISION	DRAWN	CHECKED	APPROVED

PREWITT REFINERY SITE
Prewitt, New Mexico

Figure 3-1
Lead Soil Sample Locations
Office Area

PIP	1/23/96	Prewitt.dwg
AHB	1" = 50'	

001844

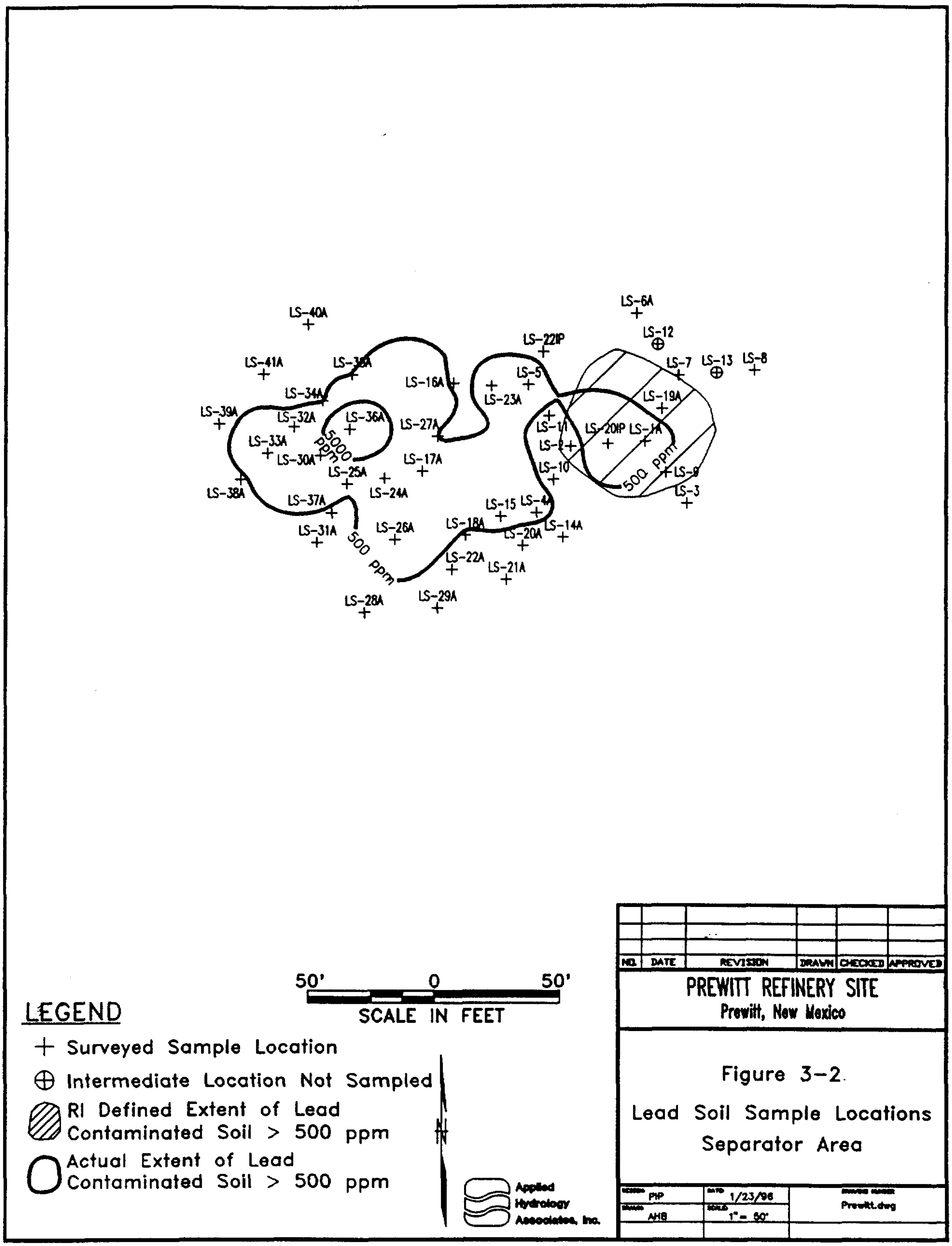
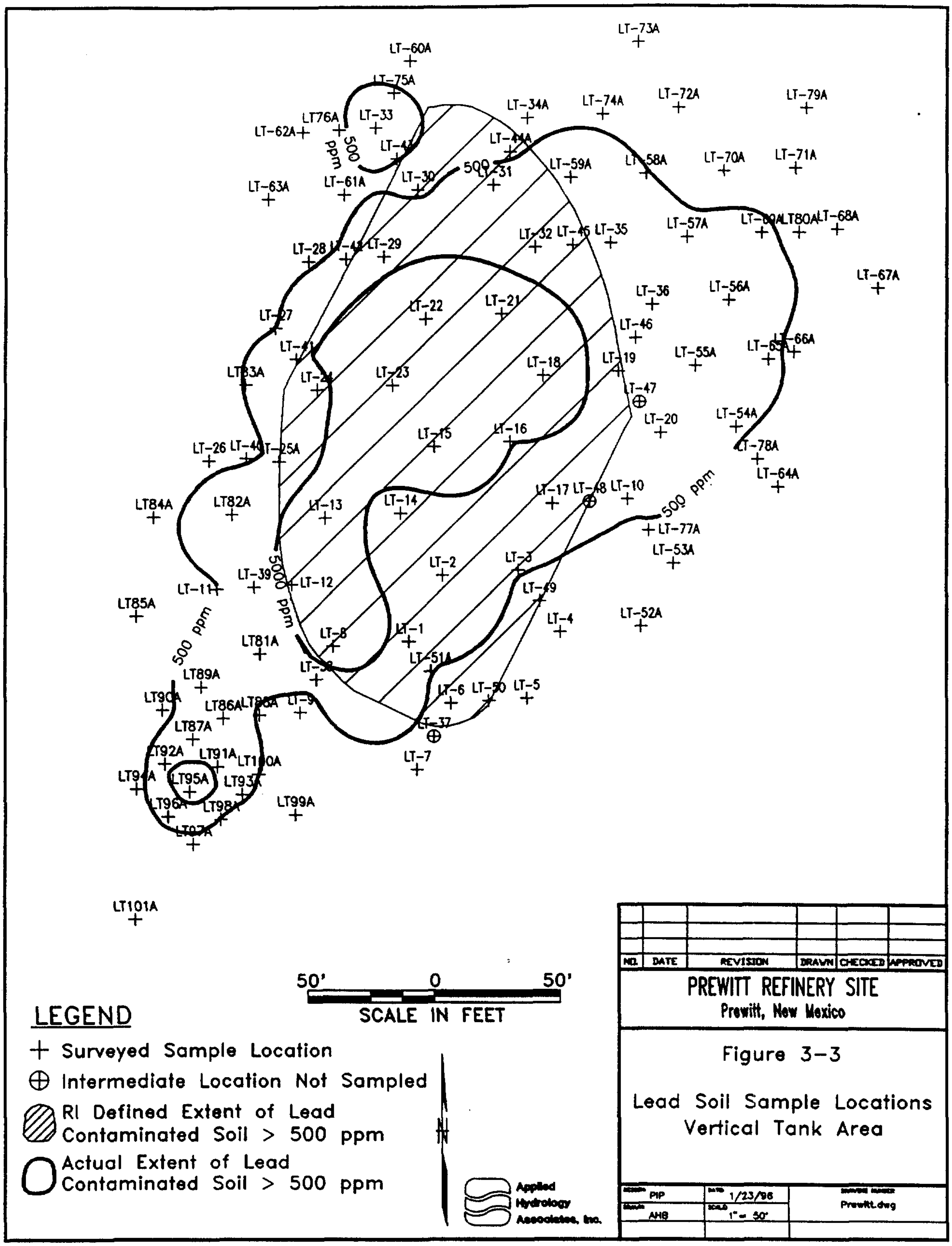
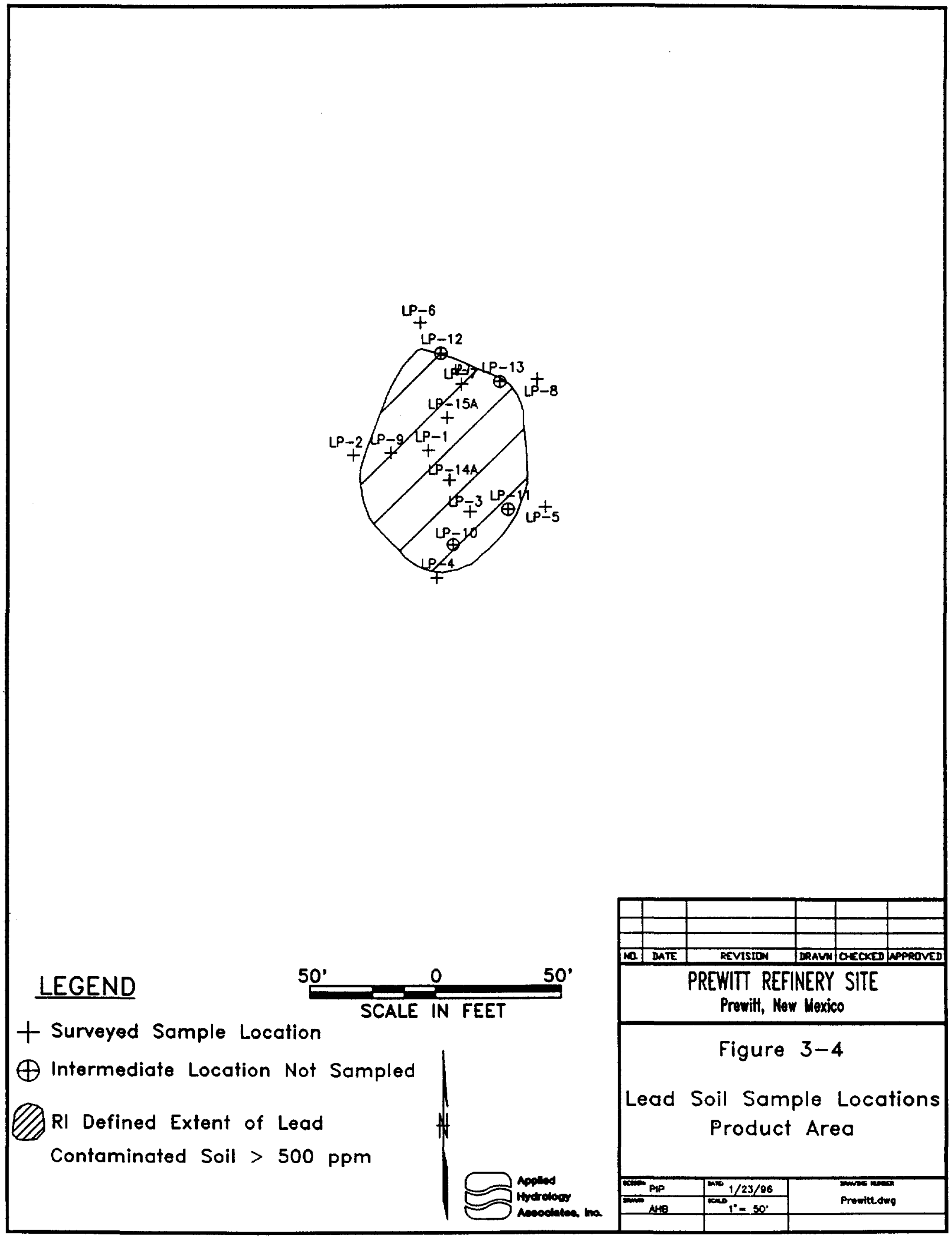


Figure 3-2
Lead Soil Sample Locations
Separator Area

001845


500 ppm
5000 ppm
50' 0 50'
SCALE IN FEET
LEGEND
+ Surveyed Sample Location
⊕ Intermediate Location Not Sampled
RI Defined Extent of Lead Contaminated Soil > 500 ppm
Actual Extent of Lead Contaminated Soil > 500 ppm
N
Applied Hydrology Associates, Inc.
NO. DATE REVISION DRAWN CHECKED APPROVED
PREWITT REFINERY SITE
Prewitt, New Mexico
Figure 3-3
Lead Soil Sample Locations
Vertical Tank Area
PIP
1/23/96
AHB
1" = 50'
Prewitt.dwg

001846


LP-6
LP-12
LP-7
LP-13
LP-8
LP-15A
LP-2
LP-9
LP-1
LP-14A
LP-3
LP-11
LP-5
LP-10
LP-4
LEGEND
Surveyed Sample Location
Intermediate Location Not Sampled
RI Defined Extent of Lead Contaminated Soil > 500 ppm
50' 0 50'
SCALE IN FEET
N
Applied Hydrology Associates, Inc.
NO. DATE REVISION DRAWN CHECKED APPROVED
PREWITT REFINERY SITE
Prewitt, New Mexico
Figure 3-4
Lead Soil Sample Locations
Product Area
PIP
AHB
1/23/96
1" = 50'
Prewitt.dwg

001847

3.2.2 Procedures for Soil Sampling and Analysis

Once sample locations were established, soil samples were obtained using a hand auger (2-inch and 3-inch diameter) or hand-driven split-barrel sampler (2-inch diameter) as depicted in Figure 3-5. Composite samples were collected from the upper one foot of the soil. Samples from deeper than one foot were taken in some areas but proved difficult to collect due to the presence of rock, obstructions and hardpan soils. Instead, determination of the depth of removal in the delineated lead-contaminated soil locations was determined from excavation control sampling and XRF analysis in the field.

Following the collection of samples in the field, the steps of sample preparation outlined below were performed.

- Soil samples were collected in resealable plastic bags and labeled to indicate sample location and depth as prescribed by the sampling and analysis plan (SAP) of the RD.
- Samples were taken to the soil preparation area where samples were logged in and documented on chain of custody records, as shown in Figure 3-6.
- Samples were placed in steel pans and dried in an oven, as shown in Figure 3-7.
- Large rocks, roots, and organic debris was removed from the dried samples.
- Samples were run through a motorized jaw crusher at least two times, as shown in Figure 3-8.
- Samples were ground with a mortar and pestle and run through a 10-mesh sieve, as shown in Figure 3-9.
- Samples were blended in pans and divided into quarters using a Jones sample splitter. Opposite quarters were recombined and samples were split and recombined again, as shown in Figure 3-10.

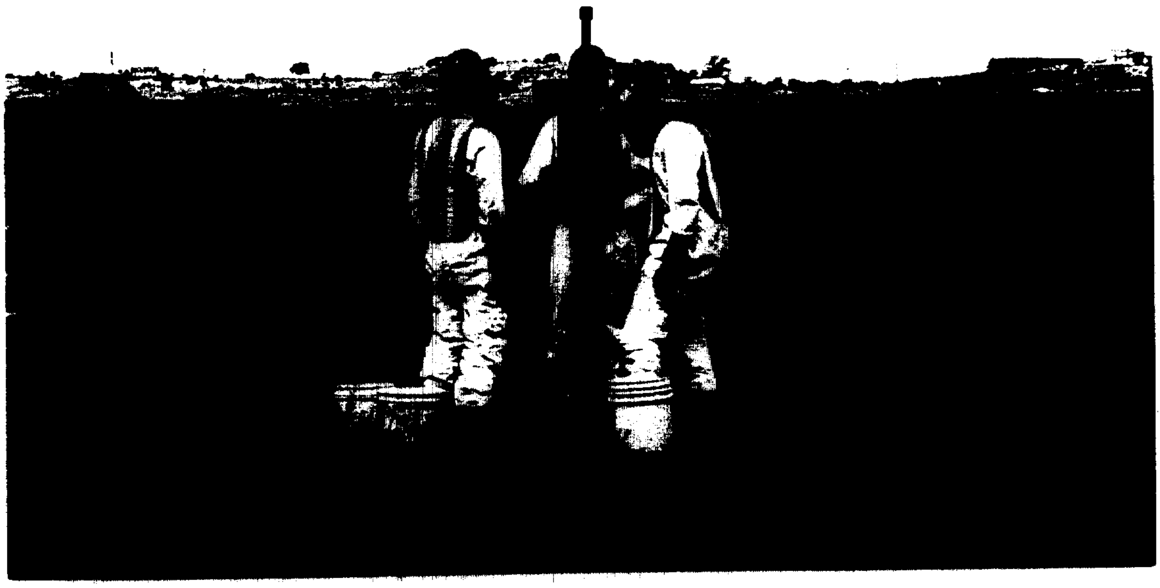


FIGURE 3-5 - Collection of Lead Soil Samples with a Split Barrel Sampler

FIGURE 3-6 - Documentation of Lead Soil Sample Preparation (Chain-of-Custody)

FIGURE 3-7 - Oven Drying of Lead Soil Samples

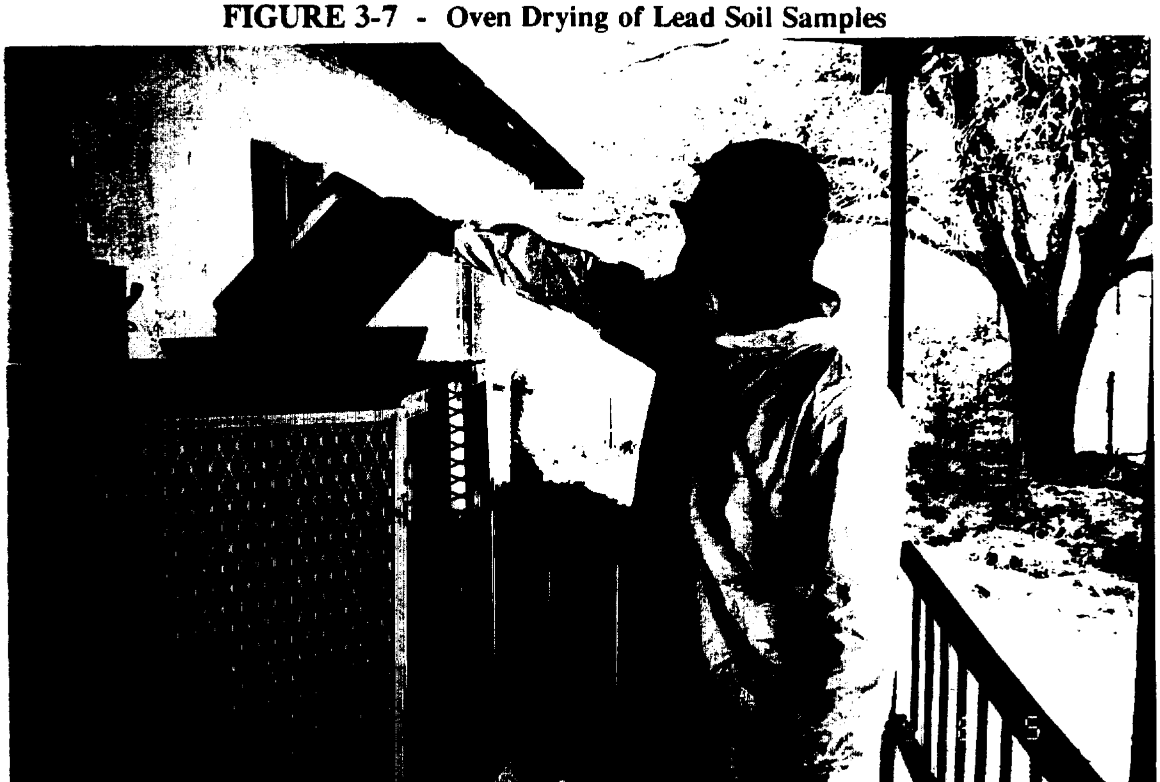


FIGURE 3-8 - Pulverizing Lead Soil Samples in the Motorized Jaw Crusher

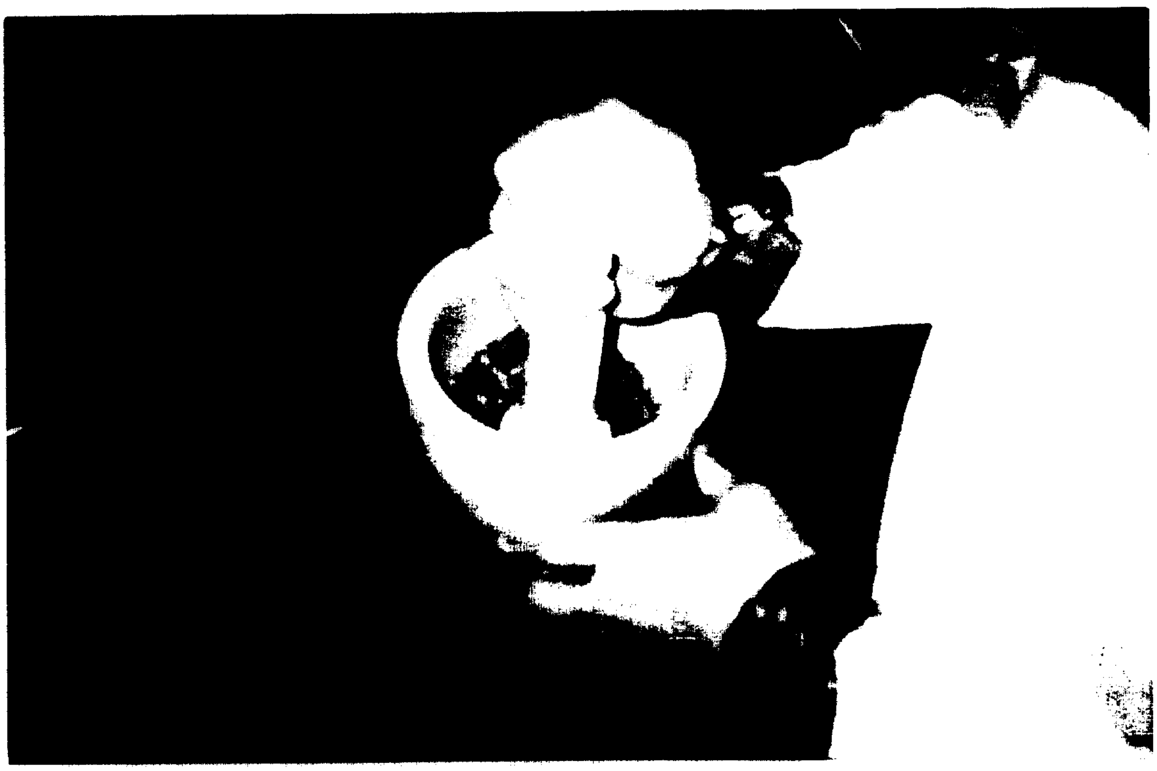


FIGURE 3-9 - Manual Grinding of Lead Soil Samples with a Mortar and Pestle

FIGURE 3-10 - Dividing Lead Soil Samples Using a Jones Sample Splitter

- A small amount of sample (about 10 grams) was split out with the sample splitter and placed in an XRF sample cup, contained with Mylar film, and secured with a retaining ring. Sample cups were labeled with the sample name and sequentially as they were prepared. XRF duplicate samples were prepared the same way.

- The remaining portions of samples were placed back in their original plastic bags, sealed, and stored in a locked shed until delineation was complete.

- During the initial delineation sampling, roughly twenty-five percent of samples were split and placed in pre-cleaned 4 ounce glass jars and sent to a laboratory for independent analysis by EPA SW-846 Method 6010. These values were used to develop a correlation between the XRF values and those determined in the laboratory.

- Once the correlation between the XRF and the laboratory was established, more than ten percent of samples were split and placed in pre-cleaned 4-ounce glass jars and sent to a laboratory for independent analysis by EPA SW-846 Method 6010. These values were used as quality control checks of the XRF.

Following the preparation of samples, soil analyses by XRF were performed in accordance with the XRF operation manual and the Remedial Action Quality Assurance Plan (QAP). The XRF detection limit for lead in soils at the Site was determined to be about 40 parts per million (ppm). Because this detection limit was well below the 500 ppm action level, the XRF was an effective tool for lead soil characterization. The generalized XRF analytical procedures are outlined below.

- Following an instrument warm up period, the energy calibration of the instrument was checked using a pure iron element sample. If the calibration was outside acceptance limits defined by the manufacturer, an internal calibration was run until calibration criteria were met.

- The absence of lead contamination of the instrument or zero background check was performed with a block of Teflon®. The probe window and centering ring were cleaned until no significant contaminants were detected on the blank. Source exposure periods were extended to maximize the ability to detect contamination of the instrument. Zero blanks were performed at least once for every 20 field samples.

- Two lead standards containing 161 ppm and 1,162 ppm lead (commercially available standard reference materials of known lead concentrations) were analyzed to verify the accuracy of lead measurements. The analysis of one of those lead standards was performed at least once for every 20 field samples.

XRF analytical results for each sample were recorded on the same chain of custody forms used to log samples during sample preparation. These forms are included in Appendix 3.3. Lead concentrations measured with the XRF analyzer for designated samples and for quality control samples were also stored in the XRF analyzer and downloaded to a computer file at the end of each day. XRF analytical results are provided in Appendix 3.3. The tables include the analysis date and time, the XRF-measured lead concentration, and "calculated" lead concentration based on the site specific regression.

Calculated lead concentrations were determined from the linear regression relationship between the XRF measurements and corresponding laboratory analytical results for lead values between detection levels and 5,000 ppm. The correlation between the XRF results and laboratory analyses was biased to include data below 5,000 ppm to avoid having high lead concentrations influence the slope of the regression (Appendix 3.4). Analytical reports for sample splits taken during lead delineation sampling that were sent to a laboratory for independent analysis by EPA SW-846 Method 6010 are provided in Appendix 3.2.

The primary purpose of the delineation sampling was to determine the areas with soil lead concentrations above 500 ppm. It was therefore most critical to accurately measure lead concentrations close to the cleanup criteria (500 ppm and 1,000 ppm). These results determined whether soil would be excavated. The absolute definition of concentration at high levels (greater than 5,000 ppm) was less critical because laboratory waste profiling analyses of excavated soils would determine disposal restrictions. A secondary purpose of the analysis was to segregate soil stockpiles with lead concentrations above 5,000 ppm from those with lower concentrations. This effort helped minimize the generation of hazardous lead-contaminated waste.

3.2.3 Delineation of Lead Isoconcentrations

Delineation of the 500 ppm lead isoconcentration contour was performed for the 0-1 foot interval in the lead-contaminated soil areas using calculated lead concentrations for the office area, the vertical tank area, and the separator area. The estimated lead concentrations for the sampling locations in the office area, the vertical tank area, the separator area, and the product area are provided in Appendix 3.5. Sample numbers that are missing in the sequence in these tables correspond with intermediate points established in the original grid survey that were not sampled. The sampling of these locations was not necessary to establish the 500 ppm boundary of lead-contaminated soil. Missing elevations correspond with locations which were established by tape measurements in the field after the initial survey was completed.

The 500 ppm lead isoconcentration was determined from a Krieging interpolation algorithm using the Surfer® for Windows contouring and mapping program. The 5,000 ppm lead isoconcentration was also determined to enable soils from high soil lead areas (greater than 5000 ppm) to be segregated in separate stockpiles in order to control the potential volume of soil that would be classified as hazardous due to lead toxicity. Figures 3-1, 3-2, 3-3, and 3-4 show the final extent of the lead soil 500 ppm boundary relative to the original areas of lead-contaminated soil identified in the RD.

Lead-contamination was not found at any sample location in the Product Area. Delineation of the aerial extent of lead-contaminated soils in the four previously identified locations was completed in early June 1995.

3.3 Excavation and Stockpiling of Lead-Contaminated Soils

Once the extent of lead-contaminated soils had been delineated, the perimeter of the area at each lead soil location was staked and marked with spray paint in the field by the SC/QAO as shown in Figure 3-11. An exclusion zone was established around the entire area where lead-contaminated soils were delineated. The perimeter of the area found to have lead soil concentrations greater than 5,000 ppm was also staked and marked with spray paint. Excavation of lead-contaminated soils started in the Vertical Tank area within the area delineated to have greater than 5,000 ppm lead. Soil excavation was performed as follows:

- Surface soils were removed initially to a depth of at least 6 inches within the areas delineated to have soil lead concentrations greater than 500 but less than 5,000 ppm.

- During excavation and stockpiling of lead-contaminated soils, water was applied by a water truck and sprayed to minimize fugitive dust emission.

- Surface soils were removed initially to a depth of at least one foot within the areas delineated to have soil lead concentrations greater than 5,000 ppm.

- Excavated soils were placed in stockpiles located on a graded surface on which the 40-mil HDPE liner was installed as shown in Figure 3-12. The lead soil stockpiles were also covered with 40-mil HDPE liner material each night and during inactive periods as shown in Figure 3-13.

- Soils were segregated in stockpiles according to lead concentrations. Soils with lead concentrations greater than 5,000 ppm were placed in separate stockpiles from soils with lead concentrations less than 5,000 ppm. Also, soils excavated from within the lead soil areas that showed any visible hydrocarbon staining were segregated and placed in a stockpile designated for lead- and hydrocarbon-contaminated soils.

- Soil stockpiles were limited to approximately 500 cubic yards in accordance with the RD. Once soil placement was completed at a designated stockpile, composite samples were collected and submitted for TCLP-lead analysis in accordance with the approved RD.

001856

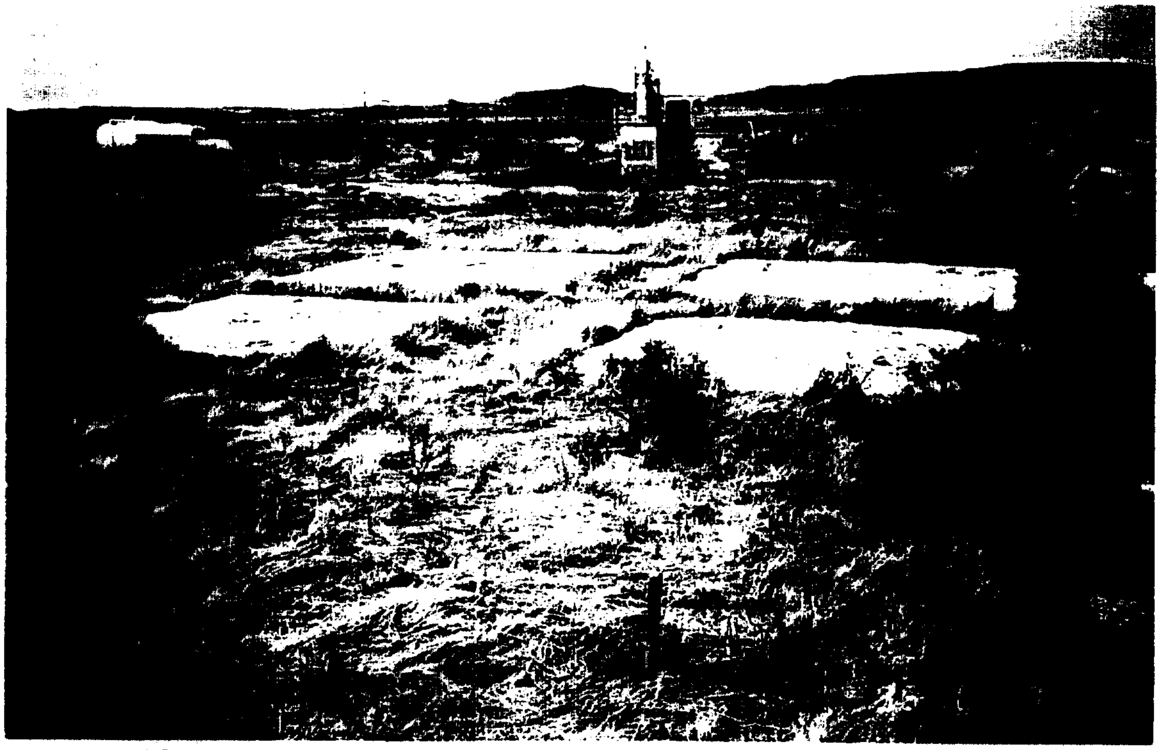


FIGURE 3-11 - Field Delineation of Lead Soil Excavation Boundaries

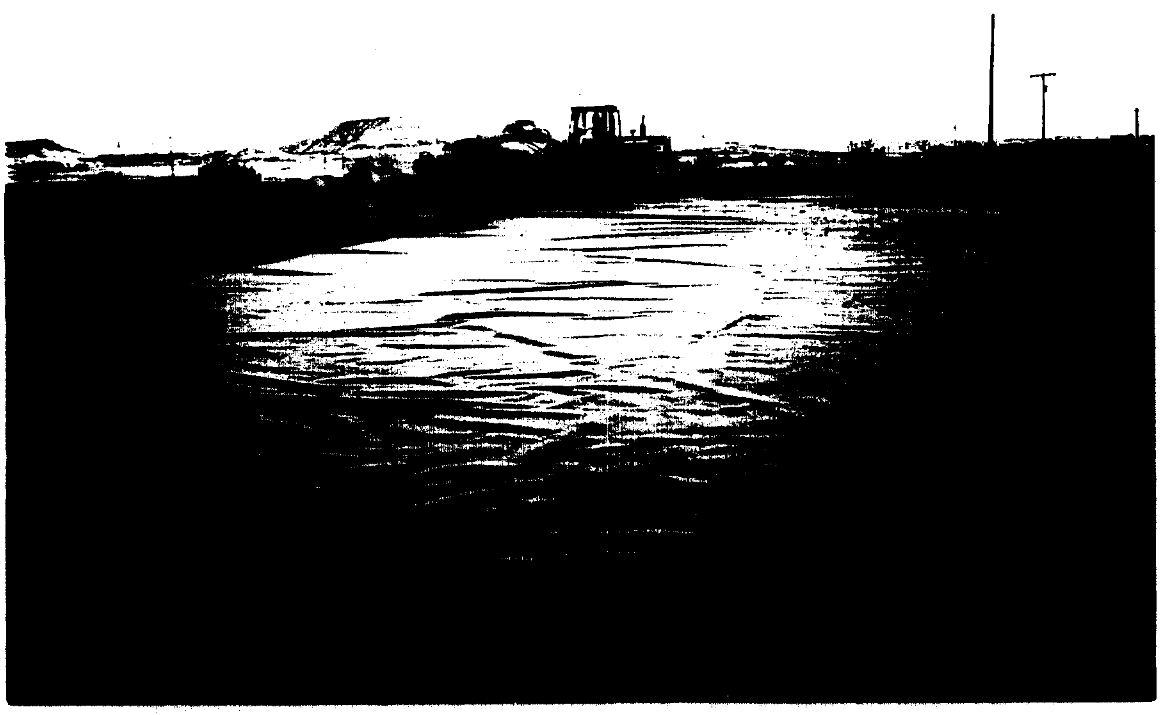


FIGURE 3-12 - Installation of HDPE Liner for Lead Soil Stockpiles

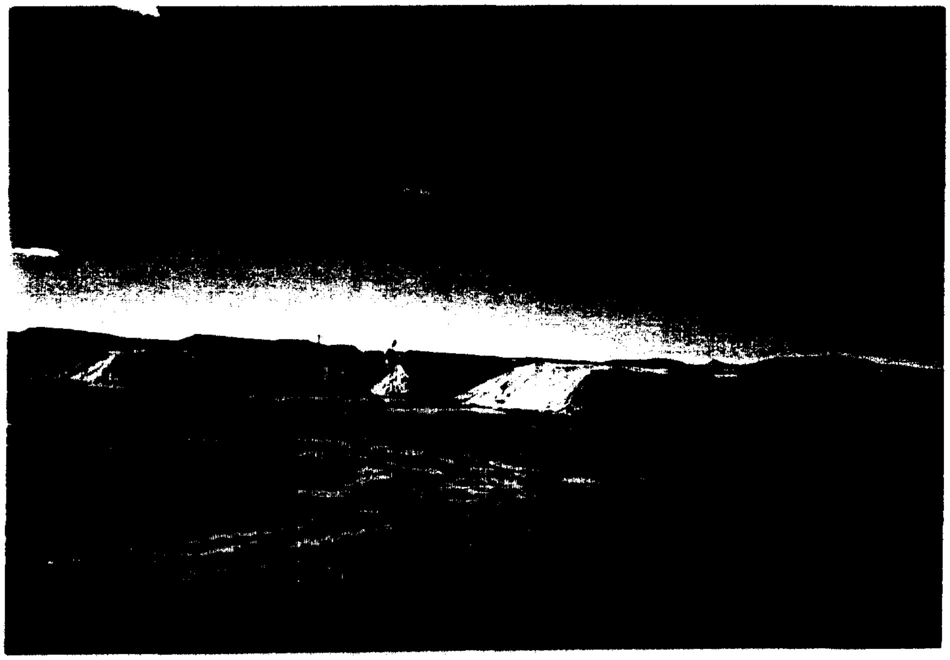


FIGURE 3-13 - Stockpiles of Lead-Contaminated Soil

- After the initial excavation of contaminated soil was completed in a given area, the excavated area was checked for soil lead concentration. Several methods for excavation control sampling were performed and compared to the results of XRF analyses performed in accordance with the confirmatory sample preparation and analytical procedures. The methods adopted for excavation control sampling involved the collection of auger samples to a depth of 4-inches on 15 foot centers. For each sample, soil aggregates were crushed and the sample was mixed in a large coffee can. A field measurement of lead concentration was taken on the prepared sample using the XRF.

- Based on the results of the excavation control sampling, the SC/QAO marked the perimeter of the areas at each lead soil location where further excavation was required, as shown Figure 3-14. Excavation and field excavation control checking continued in each area until the results indicated that the cleanup criteria were met.

001858

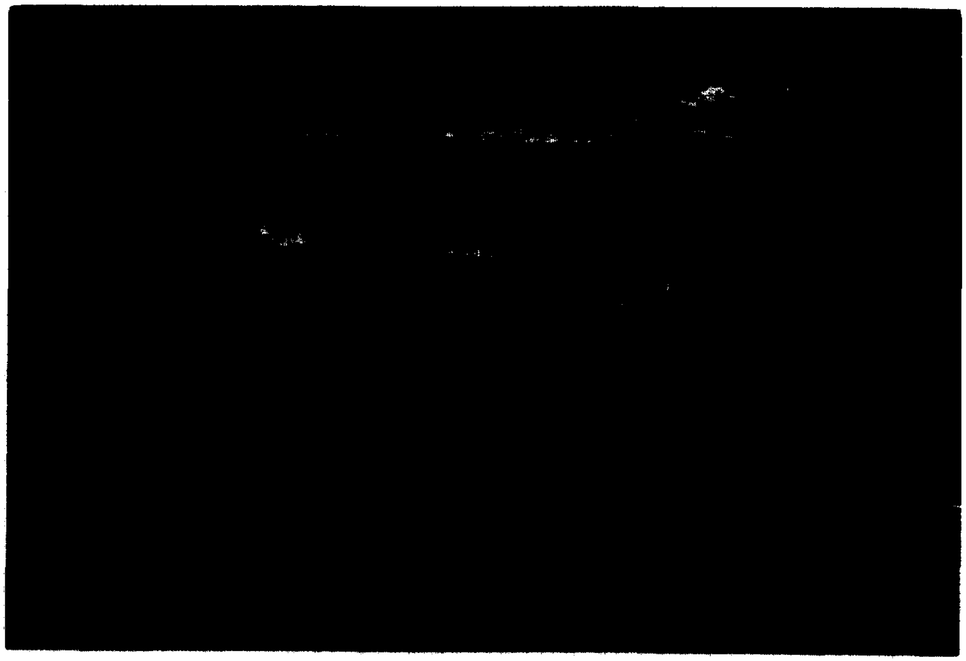


FIGURE 3-14 - Field Delineation for Further Excavation of Lead Soil

- Following completion of excavation control sampling, the confirmatory sampling locations for the grid at each lead soil area were resurveyed and staked for sampling as shown in Figure 3-15. Confirmatory sampling was performed at these locations in accordance with the RD as described in Section 3.5 of this report. At any location where the confirmatory sample result failed to meet the clean-up criteria, further excavation was performed and the location resampled in accordance with the RD until clean-up criteria where achieved.

The pre-excavation topography for office, separator, and vertical tank lead soil areas is provided in Figures 3-16, 3-17, and 3-18, respectively.

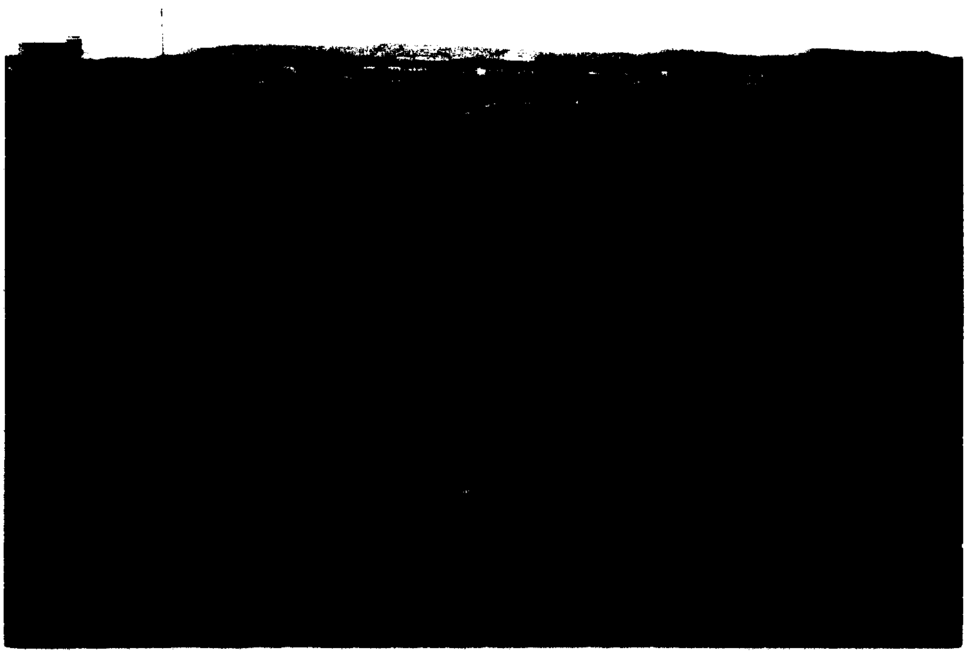
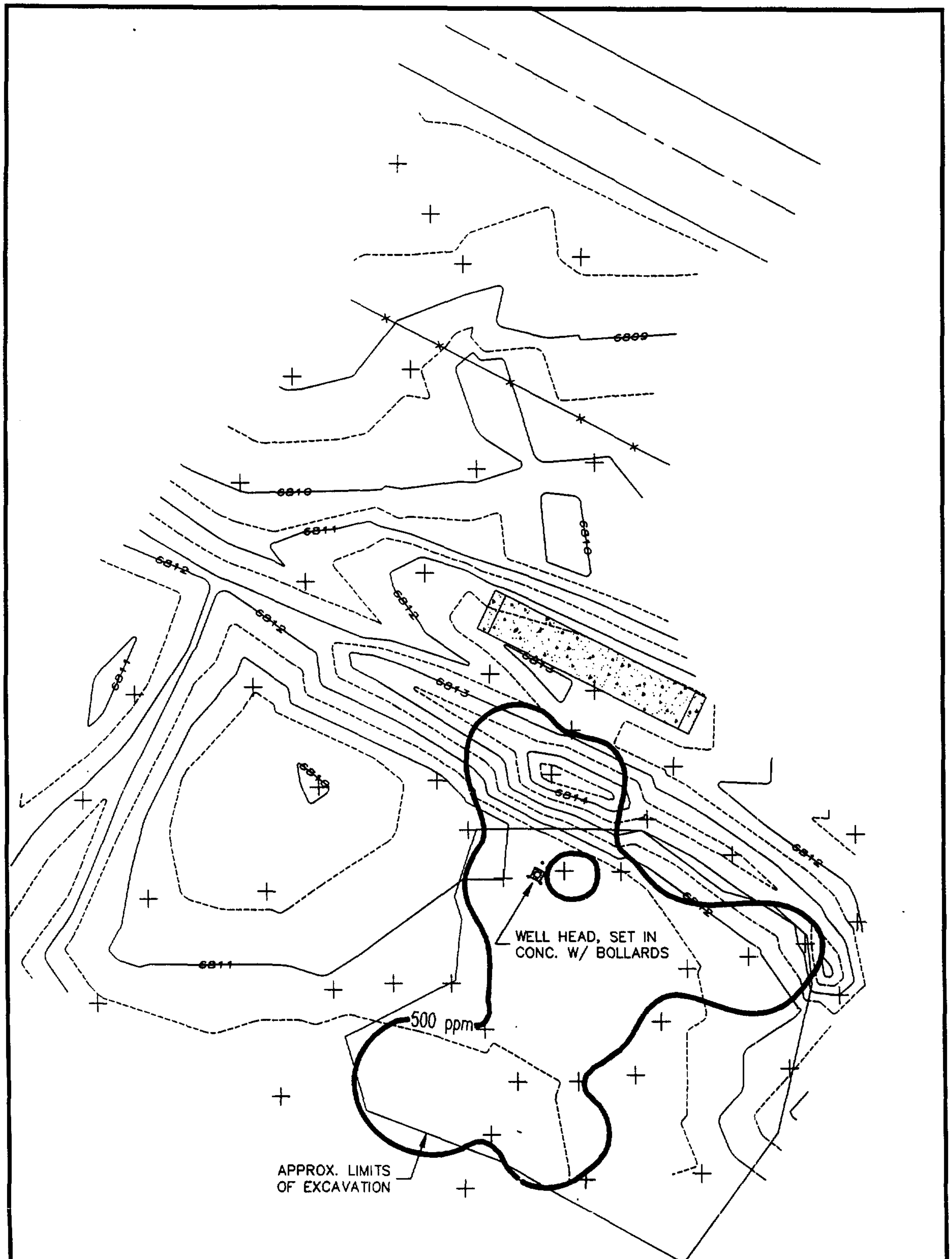


FIGURE 3-15 - Field Staking of Lead Soil Confirmatory Sample Locations



25' 0 25'
SCALE IN FEET

LEGEND

Lead Contaminated Soil >500 ppm

+ Sample Location

— Elevation Contour (ft. amsl)

--- Half-foot Elevation Contour (ft. amsl)

Applied Hydrology Associates, Inc.

NO.	DATE	REVISION	DRAWN	CHECKED	APPROVED

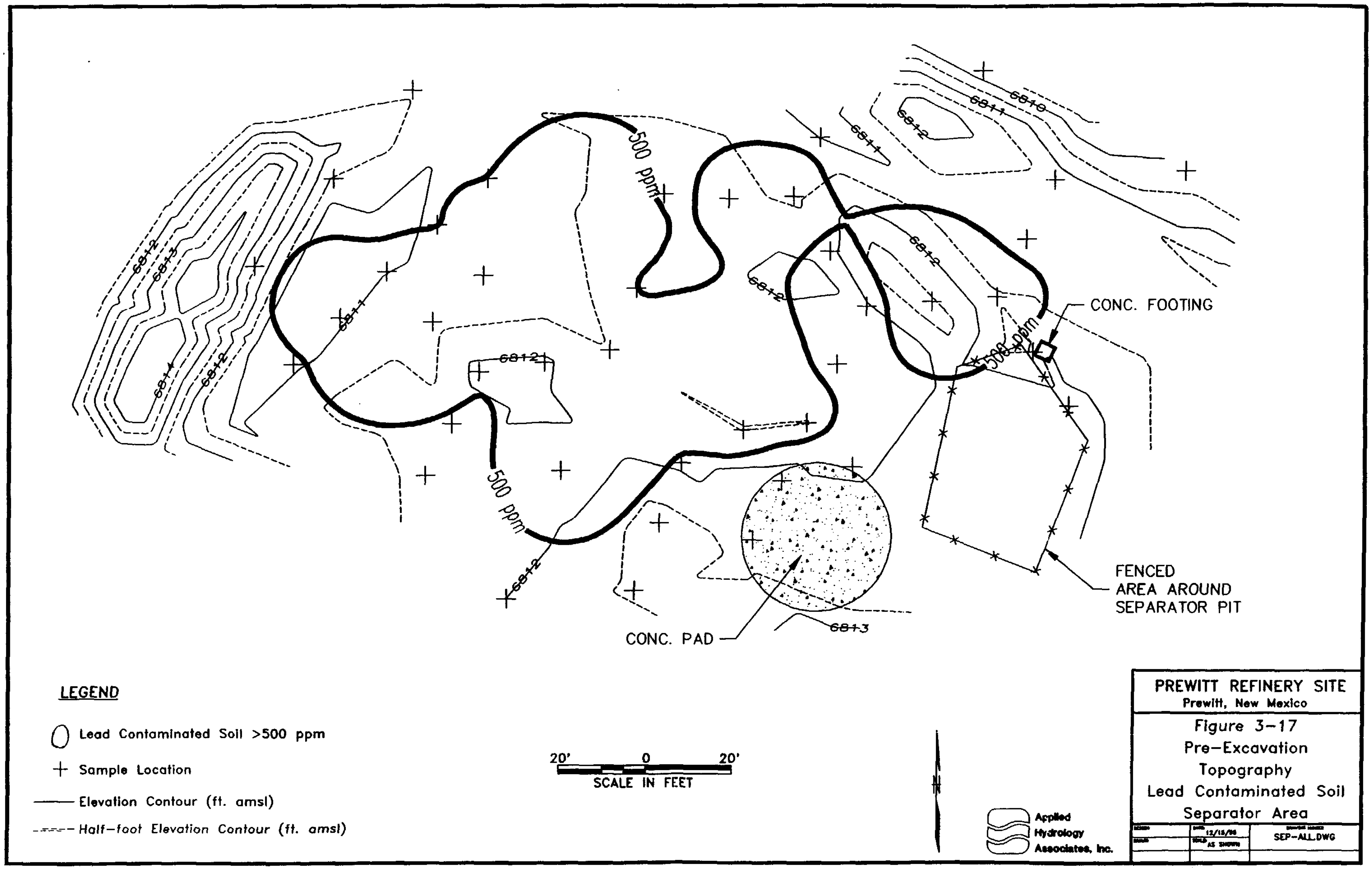
PREWITT REFINERY SITE
Prewitt, New Mexico

Figure 3-16
Pre-Excavation
Topography
Lead Contaminated Soil
Office Area

PJP	1/4/96	OFF-ALL.DWG		
AHB	As Shown			

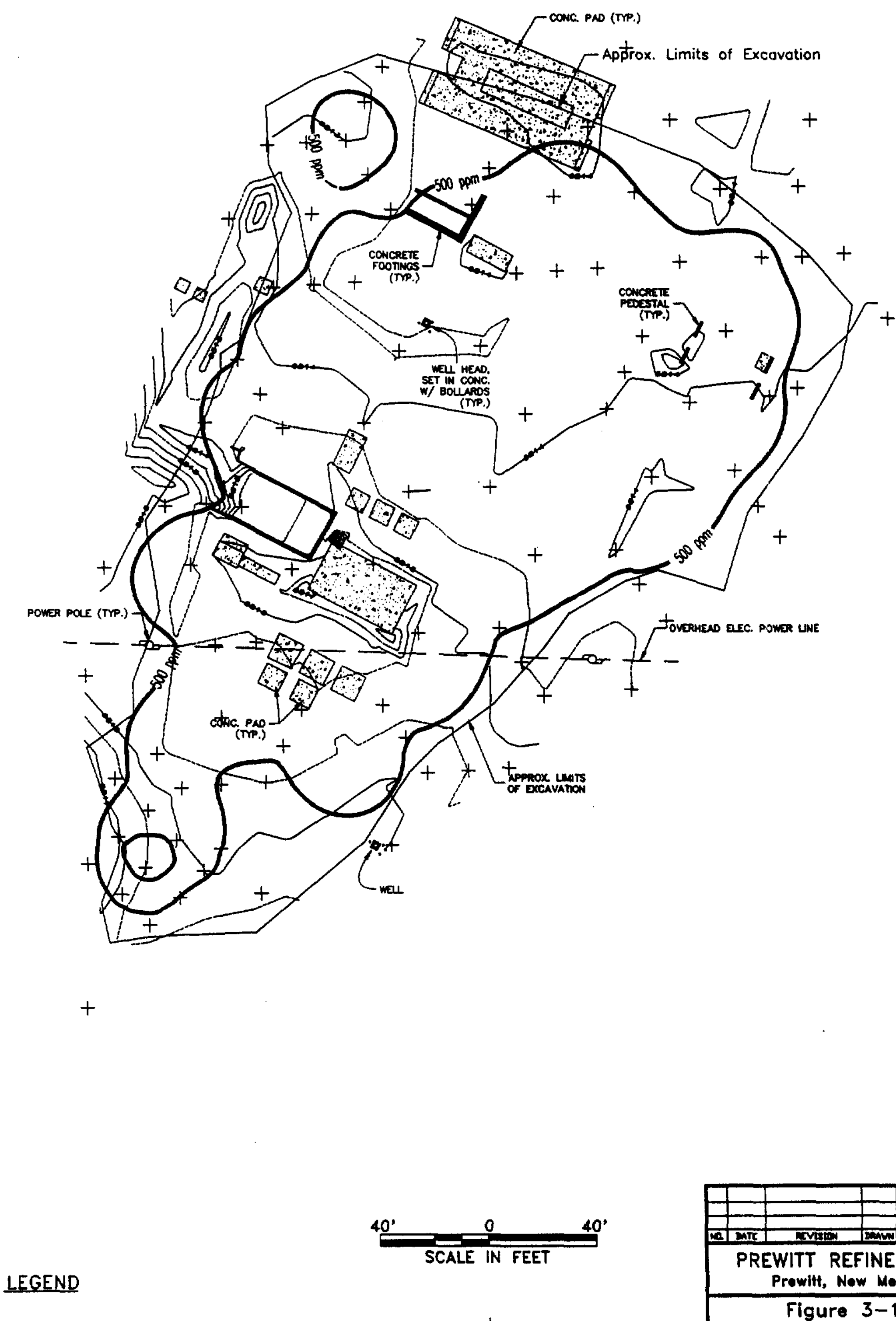
3-22

001860


6810
6811
6812
6813
6814
500 ppm
CONC. FOOTING
FENCED
AREA AROUND
SEPARATOR PIT
CONC. PAD
LEGEND
Lead Contaminated Soil >500 ppm
Sample Location
Elevation Contour (ft. amsl)
Half-foot Elevation Contour (ft. amsl)
20' 0 20'
SCALE IN FEET
N
Applied
Hydrology
Associates, Inc.
PREWITT REFINERY SITE
Prewitt, New Mexico
Figure 3-17
Pre-Excavation
Topography
Lead Contaminated Soil
Separator Area
12/15/96
AS SHOWN
SEP-ALL.DWG

001861

001862



LEGEND

- Lead Contaminated Soil >500 ppm
- + Sample Location
- — Elevation Contour (ft. amsl)
- --- Half-foot Elevation Contour (ft. amsl)

Applied Hydrology Associates, Inc.

NO.	DATE	REVISION	DRAWN	CHECKED	APPROVED

PREWITT REFINERY SITE
Prewitt, New Mexico

Figure 3-18
Pre-Excavation
Topography
Lead Contaminated Soil
Tank Area

DATE 1/4/96 SCALE As Shown TNK-ALL.DWG

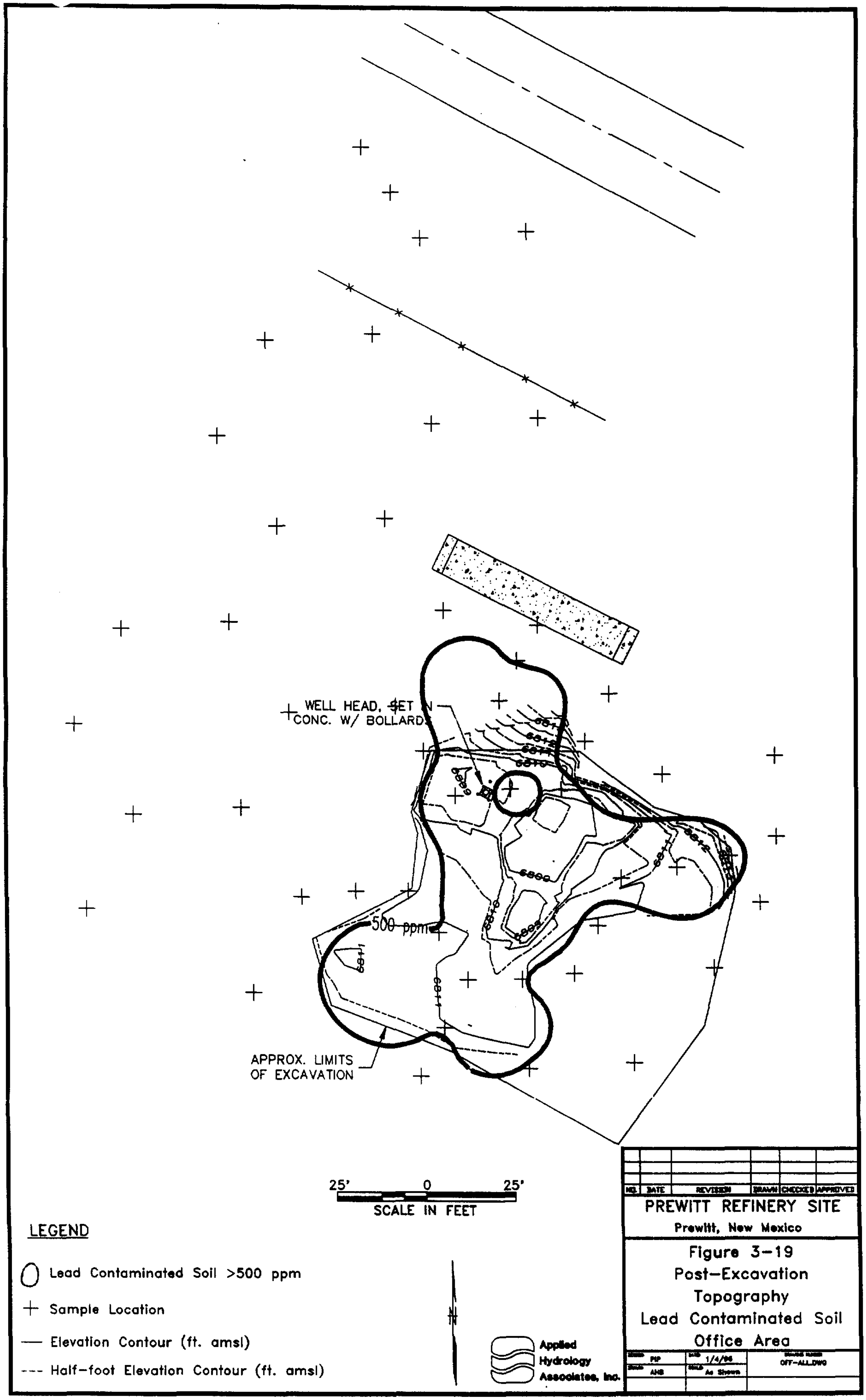
The post-excavation topography for office, separator, and vertical tank lead soil areas is provided in Figures 3-19, 3-20, and 3-21, respectively. Pre- and post-excavation topography were not provided for the product lead soil area since lead contaminated soils were not found here during delineation sampling. Nevertheless, about two cubic yards of soil was removed from the product area around P-1, the point of the highest detected lead concentration identified in the RI. The soil was excavated to a depth of about eight to twelve inches and the confirmatory sampling location for P-1 was surveyed, staked and sampled after excavation as shown in Figure 3-22 to insure that the lead contaminated soils were not found below the surface in the product area.

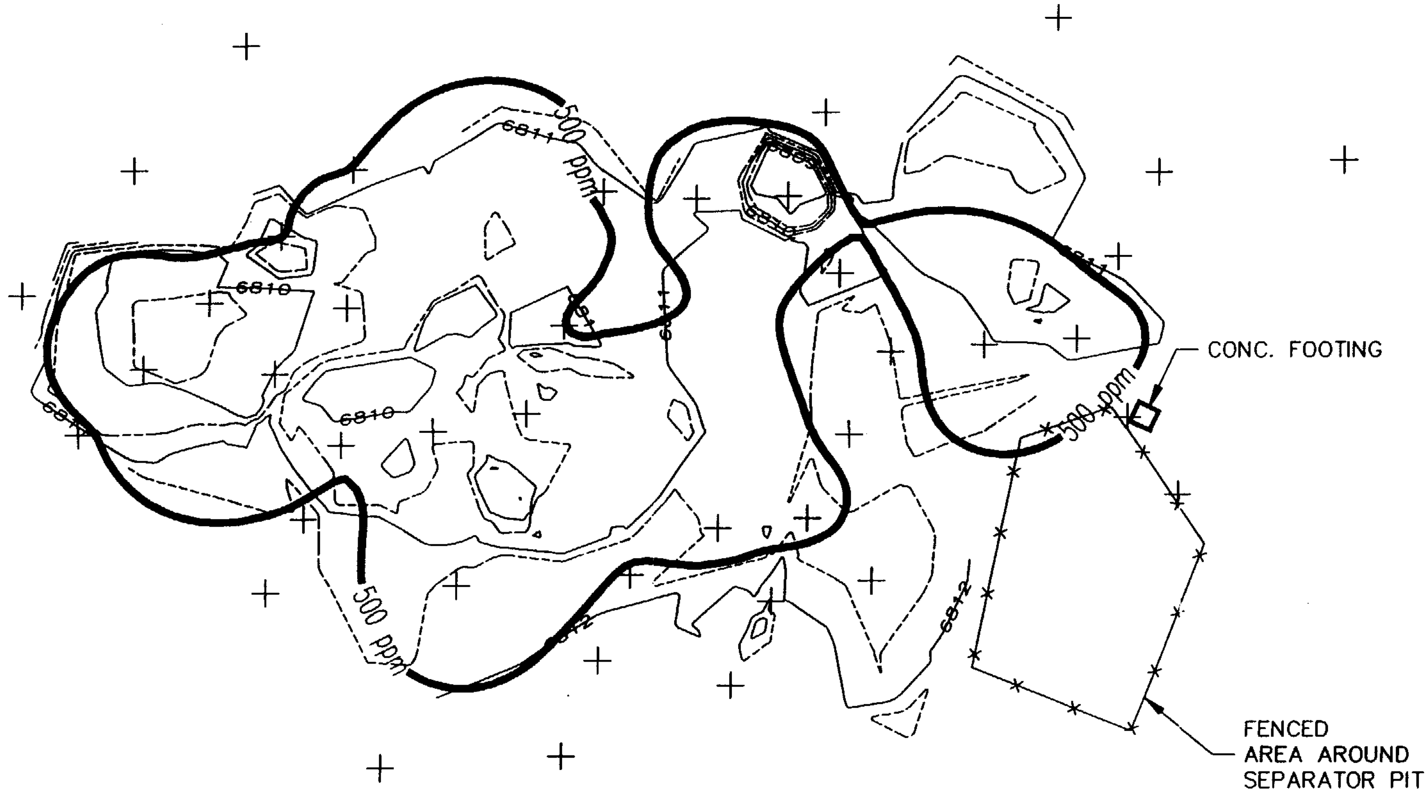
The volumes of lead soil excavated from the office, separator, and vertical tank areas were determined from the pre- and post-excavation topographic surveys. The total excavated volumes from the office, separator, and vertical tank areas were 239, 334, and 2,085 cubic yards, respectively. An estimated volume of about 2 cubic yards of soil was removed from the product area.

3.4 Transportation and Disposal of Lead-Contaminated Soils

3.4.1 Waste Identification and Waste Characterization

A composite sample was taken from the initial stockpile of excavated soils. This stockpile (#1) contained soils from locations identified as having lead concentrations greater than 5,000 ppm. The sample from this stockpile was analyzed for TCLP-lead. The result of 66 ppm exceeded the 5 ppm criteria for leachable lead. Composite samples were taken from all stockpiles of excavated soils. All stockpiles that yielded samples that exceeded this criteria were classified as hazardous lead soil (D008). The TCLP-lead analytical results from these stockpiles are summarized in Table 3-1. Complete analytical results are provided in Appendix 3-6.


WELL HEAD, SET IN CONC. W/ BOLLARDS
500 ppm
APPROX. LIMITS OF EXCAVATION
25' 0 25'
SCALE IN FEET
LEGEND
Lead Contaminated Soil >500 ppm
Sample Location
Elevation Contour (ft. amsl)
Half-foot Elevation Contour (ft. amsl)
N
Applied Hydrology Associates, Inc.
NO. DATE REVISION DRAWN CHECKED APPROVED
PREWITT REFINERY SITE
Prewitt, New Mexico
Figure 3-19
Post-Excavation Topography
Lead Contaminated Soil
Office Area



LEGEND

Lead Contaminated Soil >500 ppm

+ Sample Location

—— Elevation Contour (ft. amsl)

----Half-foot Elevation Contour (ft. amsl)

20' 0 20'
SCALE IN FEET

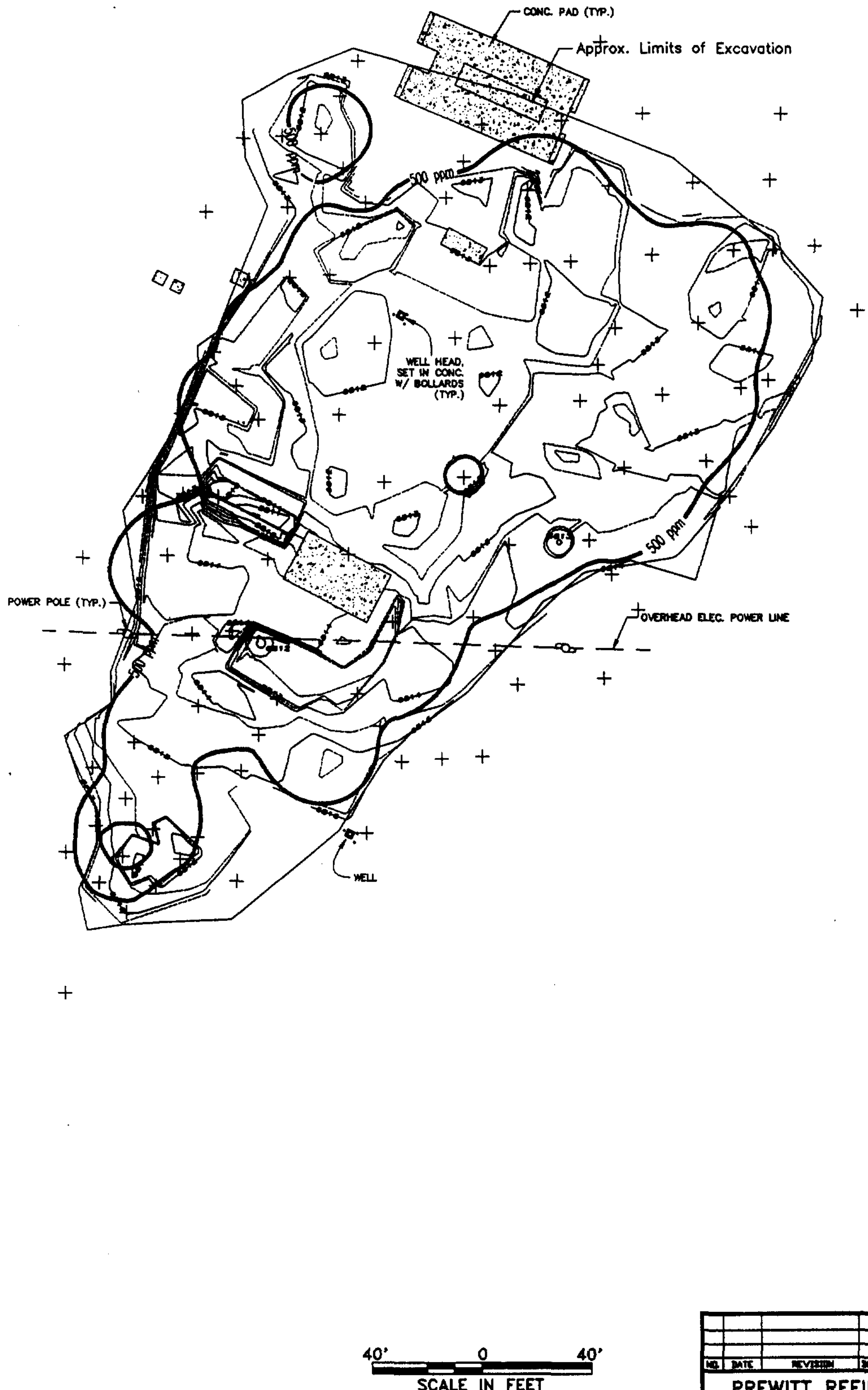
N

Applied Hydrology Associates, Inc.

PREWITT REFINERY SITE
Prewitt, New Mexico

Figure 3-20
Post-Excavation
Topography
Lead Contaminated Soil
Separator Area

12/15/95 AS SHOWN SEP-ALL.DWG



LEGEND

- Lead Contaminated Soil >500 ppm
- + *Sample Location*
- — Elevation Contour (ft. amsl)
- --- Half-foot Elevation Contour (ft. amsl)

Applied Hydrology Associates, Inc.

NO.	DATE	REVISION	DRAWN	CHECKED	APPROVED

PREWITT REFINERY SITE
Prewitt, New Mexico

Figure 3-21
Post-Excavation Topography
Lead Contaminated Soil
Tank Area

PIP	1/4/96	TNK-ALL.DWG
AHS	As Shown	

FIGURE 3-22 - Excavation and Confirmatory Sample Location, Product Area

TABLE 3-1

Summary of Lead Soil Stockpile Characterization and Removal

Stockpile Number	Estimated Lead Concentration (ppm)	Estimated Volume (cubic yards)	Sample ID	TCLP Results (mg/L Pb)	Shipment Completed	Destination Facility	Hydrocarbon Present?	Other Analyses (mg/Kg)
1	>5,000	425	AP-8	66	6/30/95	US Ecology	No	N/A
2	500 to 5,000	325	AP-9	2.0	6/23/95	Waste Mng.	No	N/A
3	500 to 5,000	340	AP-10	5.3	6/30/95	US Ecology	No	N/A
3 (repeat)	500 to 5,000	340	Stockpile #3	3.8	6/30/95	US Ecology	No	N/A
4	500 to 5,000	245	AP-14	53	6/30/95	US Ecology	No	N/A
5	500 to 1,000	415	AP-15	<0.05	8/3/95	Waste Mng.	No	N/A
5b	500 to 1,000	70	AP-13	0.70	6/23/95	US Ecology	Yes	4300 TPH
6	500 to 1,000	400	AP-16	11.7/11.9	8/2/95	US Ecology	No	N/A
7	500 to 1,000	505	AP-17	1.72	8/3/95	Waste Mng.	No	N/A
8	500 to 1,000	150	AP-19/AP-26	1.54/1.52	10/17/95	US Ecology	Yes	< 0.025 Bnz
9	500 to 1,000	380	AP-20	0.07	8/11/95	Waste Mng.	No	N/A

Stockpiles containing soils excavated from within the lead soil areas that showed visible hydrocarbon staining were analyzed for Total Petroleum Hydrocarbons (TPH) as well as TCLP-lead. The stockpiles which exceeded the acceptance criteria of 1000 ppm for the Waste Management facility in Rio Rancho, New Mexico or the TCLP-lead concentration of 5 ppm were profiled and transported to the U.S. Ecology Hazardous Waste Disposal Facility in Beatty, Nevada. Lead soils that exceeded the TCLP lead concentration of 5 ppm were stabilized at the disposal facility prior to disposal.

3.4.2 Waste Manifesting, Transfer, and Disposal

Lead-contaminated soils removed from the Site during remedial action were transported to two different disposal facilities depending upon the characteristics of the waste and the acceptance criteria required by the facility. The majority of the lead soil (2,182 tons) was classified as "Hazardous Waste Solid N.O.S., Hazard Class 9, NA 3077, PG III (D008)" and was transported by licensed waste transporters to the U.S. Ecology hazardous waste disposal facility in Beatty, Nevada. A total quantity of 1,503 tons of non-hazardous lead-contaminated soil was removed from the Site and transported to the Waste Management landfill facility in Rio Rancho, New Mexico. An additional 145 tons of non-hazardous lead-contaminated soils had hydrocarbon concentrations which exceeded the acceptance criteria of the Waste Management facility. These soils were removed and transported by licensed waste transporters to the U.S. Ecology hazardous waste disposal facility.

Analytical results from waste profiling required by the disposal facility, including the TCLP lead results from soil stockpiles, are provided in Appendix 3.6. After the appropriate classification was established for a lead soil stockpile, the wastes were loaded into trucks for transportation to an appropriate off-site disposal facility, as shown in Figure 3-23.

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FIGURE 3-23 - Loading of Lead-Contaminated Soil

A waste manifest was prepared for each truck load. For lead soil wastes that were classified as "Hazardous Waste Solid N.O.S., Hazard Class 9, NA 3077, PG III (D008)" based on TCLP lead results, the manifest was prepared in accordance with 40 CFR 262. The loaded trucks were inspected by the transporter and an authorized employee or representative of ARCO/EPNG. Prior to the removal of wastes from the Site, the authorized employee or representative obtained the signature of the initial transporter and date of acceptance on the manifest. One copy of the manifest was retained at the time of shipment and an additional signed copy was returned to the Site by the permitted disposal facility upon receipt of the waste. Manifests for all lead soil waste shipments are included in Appendix 3-7 and are summarized in Table 3-2.

TABLE 3-2

Summary of Lead Soil Waste Shipment Manifests

Hazardous Lead Soil Shipments to US Ecology, Beatty, Nevada

Month	Number of Shipments	Total Payload (Tons)
June	47	1040.1
July	53	1121.01
August	1	21.2
Project Total	**101**	**2182.31**

Non-hazardous Lead Soil Shipments to Waste Management, Rio Rancho, New Mexico

Month	Number of Shipments	Total Payload (Tons)
June	17	400.89
July	19	450.99
August	30	650.64
Project Total	**66**	**1502.52**

Hydrocarbon/Lead Soil Shipments to US Ecology, Beatty, Nevada

Month	Number of Shipments	Total Payload (Tons)
October	7	144.84
Project Total	7	144.84

3.5 Health, Safety, and Regulatory Compliance

Lead soil wastes that were classified as "Hazardous Waste Solid N.O.S., Hazard Class 9, NA 3077, PG III (D008)" based on TCLP lead results, were transported to the U.S. Ecology hazardous waste disposal facility in Beatty, Nevada. These wastes soils were labeled in accordance with the DOT requirements under 49 CFR Part 172 and transported for off-site disposal within 90 days.

Prior to the off-site shipment of any hazardous waste to an out-of-state waste management facility, ARCO/EPNG provided written notification to the appropriate environmental official in the state receiving the wastes and to EPA's Remedial Project Manager (RPM). Copies of the notification letters to the State of Nevada and the U.S. EPA are provided in Appendix 3.8. These notifications provided: (1) the name and location of the facility receiving the wastes; (2) the expected type and quantity of hazardous waste shipped; (3) the expected schedule for shipment; and (4) the method of transportation.

Lead soils that exceeded the TCLP-lead concentration of 5 ppm were stabilized in accordance with 40 CFR 268 at the U.S. Ecology Hazardous Waste Disposal Facility in Beatty, Nevada prior to land disposal.

All lead-contaminated soil remedial action work was performed in accordance with the RA Health and Safety Plan. An exclusion zone was established around the lead-contaminated soil areas, around the stockpile area, and equipment corridors. Air monitoring was performed and remedial action work was started using Level C respiratory protection. Water was applied prior to and during removal to minimize dust. Air monitoring results are provided in Appendix 3.8. Based on these results, lead-contaminated soil removal work after June 14, 1995 was performed under modified Level D, PPE. However, soil sample preparation work continued to be performed under Level C respiratory protection when visible dust was present. Air monitoring results in Appendix 3.8 show that no work was performed with airborne lead over permissible limits. All remedial action work for lead-contaminated soils was completed with no injury or incidents of health or safety concern.

3.6 Confirmatory Sampling

After a lead soil area was cleared by the SC/QAO based on excavation control sampling, the sampling locations were resurveyed and staked for confirmatory sampling. Confirmatory sampling was performed at these locations in accordance with the RD.

Once confirmatory sample locations were established, soil samples were obtained using a hand auger (2-inch and 3-inch diameter) or hand-driven split-barrel sampler (2-inch diameter). Samples were collected from the upper 4-inches of the soil in accordance with the RA SAP. The same steps for sample preparation and analysis that were followed for delineation sampling were performed on confirmatory samples.

A new XRF instrument (Q-61) was sent to the Site during excavation control sampling to replace one that had malfunctioned. As was done with the original instrument, the Q-61 XRF was "calibrated" from the linear regression relationship between the XRF measurements of samples and corresponding laboratory analytical results. Laboratory-determined lead concentrations between the XRF detection limit and 1,000 ppm were used in the regression analysis. The correlation between XRF results and laboratory analyses was biased to include data in the range 40 to 1,000 ppm because the purpose of the confirmatory sampling was to determine whether the clean-up concentrations of 500 ppm and 1,000 ppm had been achieved. An accurate determination of concentrations above 1,000 ppm was not important to confirmatory sampling. Therefore, data above 1,000 ppm were not used in the calibration to avoid having high lead concentrations influence the slope of the regression.

The linear regression relationship is provided in Appendix 3.9. The slope factor from this relationship was then programmed into the XRF, so that the lead concentrations measured by the XRF read in parts per million (ppm) calibrated with laboratory results. XRF analytical results for each sample were recorded on the same chain of custody forms used to log samples in during sample preparation. Copies of these forms are included in Appendix 3.10. Lead concentrations measured with the XRF unit for designated samples and for quality control samples were also stored in the XRF unit and downloaded to a computer file at the end of each day. Analysis date, time, and XRF lead concentration for sample locations are provided in Appendix 3.10, "XRF Confirmatory Sample Results".

The clean-up criteria required to be attained at confirmatory sample locations were less than 500 ppm total lead within areas excavated to depths less than 2 feet and 1,000 ppm total lead within areas excavated to depths of 2 feet or greater. At any location where the confirmatory sample result failed to meet the clean-up criteria, additional samples were collected at intermediate points between adjacent confirmatory sampling locations (either 15 feet or 7.5 feet distances). These samples were used to establish a perimeter on the extent of excavation (as performed with excavation control samples, as shown in Figure 3-14).

After excavation was performed and field checked, the confirmatory sampling point was relocated and resampled in accordance with the RD. In some cases several rounds of confirmatory sampling and removal work were required to meet the clean-up criteria. Confirmatory sampling analytical results are included in Tables 3-3, 3-4, 3-5 and 3-6 for the office, separator, vertical tank, and product lead soil areas, respectively. These tables show the lead concentrations measured during delineation sampling as well as the concentrations from all confirmatory sampling. Analytical reports for sample splits taken during lead confirmatory sampling that were sent to a laboratory for independent analysis by EPA SW-846 Method 6010 are provided in Appendix 3.11.

TABLE 3-3

Summary of Lead Soil Confirmatory Sampling Results - Office Area

Sample Location	Y Northing (feet)	X Easting (feet)	Z Elevation (feet AMSL)	Delineation Lead Conc. (ppm)		Confirmatory Lead Conc. (ppm)	
				0 to 1 ft.	1 to 2 ft.	First Round	Second Round
LO-01	9371.65	33204.37	6811.33	87	45		
LO-02	9398.49	33217.68	6810.97	1,192	119	715	167
LO-03	9400.37	33247.60	6811.46	668	1,061	2,118	252
LO-04	9375.48	33264.27	6811.45	692	779	374	
LO-05	9348.55	33250.92	6811.20	212	252		
LO-06	9346.71	33221.00	6811.78	22,013	272	460	
LO-07	9319.67	33207.58	6811.93	17			
LO-08	9369.80	33174.45	6811.10	0			
LO-09	9342.85	33161.09	6811.96	17			
LO-10	9366.00	33114.57	6811.59	20			
LO-11	9392.74	33127.84	6810.57	27			
LO-12	9394.73	33157.83	6810.33	0			
LO-13	9421.57	33171.13	6809.93	85			
LO-14	9423.43	33201.04	6810.71	79			
LO-15	9450.40	33214.43	6812.06	188			
LO-16A	9446.30	33240.98	6812.69	147			
LO-17	9427.31	33260.98	6812.20	136			
LO-18	9323.65	33267.84	6811.53	160			
LO-19	9417.77	33111.25	6812.24	6			
LO-20	9444.67	33124.58	6811.32	42			
LO-21	9446.71	33154.57	6810.56	178			
LO-22	9473.41	33167.85	6811.25	48			
LO-23	9475.74	33197.96	6812.31	40			
LO-24	9502.38	33211.20	6809.82	14			
LO-25	9527.29	33194.55	6809.36	92			
LO-26	9525.30	33164.57	6808.88	71			
LO-27	9498.43	33151.24	6809.87	0			
LO-28	9553.98	33207.79	6808.55	348	20		
LO-29	9579.09	33191.23	6808.35	406			
LO-30	9555.96	33237.78	6808.36	75			

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TABLE 3-3 (Continued)

Summary of Lead Soil Confirmatory Sampling Results - Office Area

Sample Location	Y Northing (feet)	X Easting (feet)	Z Elevation (feet AMSL)	Delineation Lead Conc. (ppm)		Confirmatory Lead Conc. (ppm)	
				0 to 1 ft.	1 to 2 ft.	First Round	Second Round
LO-31	9504.13	33241.07	6810.04	98			
LO-32	9333.19	33214.30	6811.83	244	80	33	
LO-39	9566.63	33199.55	6808.34	21			
LO-43	9413.82	33254.30	6813.40	2			
LO-44	9362.01	33257.61	6811.27	264			
LO-46A	9371.56	33189.72	6811.27	87			
LO-47A	9359.93	33212.85	6811.40	197		54	
LO-48A	9410.87	33208.83	6810.77	121			
LO-49A	9381.83	33294.27	6813.18	699		344	
LO-50A	9378.51	33279.85	6811.66	869		361	
LO-51A	9425.22	33230.12	6814.94	2,545	204		91
LO-52A	9346.84	33236.34	6811.38	181		190	
LO-53A	9436.35	33235.11	6812.71	271			
LO-54	9386.83	33240.09	6808.84			1,103	101
LO-54A	9321.86	33238.12	6811.43	207	121		
LO-55A	9404.74	33275.81	6813.67	79	0		
LO-56A	9400.47	33233.18	6811.14	131	871	1,459	231
LO-57A	9350.23	33290.02	6812.41	257		0	
LO-58A	9410.04	33307.04	6811.27	51		51	
LO-59A	9387.41	33307.38	6812.24	119		119	
LO-60A	9368.64	33302.78	6812.98	202		202	
LO-61	9395.30	33218.77	6810.31			2,125	78
LO-62	9403.38	33261.27	6812.08			236	
LO-63	9415.70	33238.08	6811.78			16	
LO-65	9369.87	33235.00	6810.30			1,820	534*

* - Depth of sample greater than two feet from final surface grade (lead criteria = 1,000 ppm).

TABLE 3-4

Summary of Lead Soil Confirmatory Sampling Results - Separator Area

Sample Location	Y Northing (feet)	X Easting (feet)	Z Elevation (feet AMSL)	Delineation Lead Conc. (ppm)		Confirmatory Lead Conc. (ppm)		
				0 to 1 ft.	1 to 2 ft.	1st Round	2nd Round	3rd Round
LS-01A	9500.10	33026.87	6811.54	1,548	537	93	76	
LS-02	9498.02	32996.90	6811.94	381	63			
LS-03	9474.99	33043.45	6812.17	100				
LS-04A	9471.21	32983.57	6811.49	688	197	99		
LS-05	9523.12	32980.30	6811.40	532	306	147	1,220	0
LS-06A	9551.80	33023.56	6809.58	52				
LS-07	9526.88	33040.18	6811.35	15				
LS-08	9528.79	33070.13	6810.17	52				
LS-09	9487.48	33035.15	6811.69	47				
LS-10	9484.69	32990.25	6811.71	374				
LS-11	9510.59	32988.60	6811.88			1,574	375	
LS-14A	9461.09	32994.03	6811.71	162				
LS-15	9469.59	32969.15	6811.49	814	93	207	225	
LS-16A	9523.72	32950.36	6811.68	388		1,367		64
LS-17A	9487.97	32938.17	6811.51	2,964	228	1,483	55	
LS-18A	9462.01	32954.92	6811.89	376	121			
LS-19A	9513.34	33033.58	6811.05	33				
LS-20A	9457.82	32977.91	6812.20	32				
LS-20IP	9499.00	33011.86				559	48	
LS-21A	9444.18	32971.50	6812.30	40				
LS-22A	9448.19	32949.80	6812.75	144				
LS-22IP	9536.48	32986.23	6810.99	476				
LS-23A	9522.60	32965.50	8611.64	749		134	154	
LS-24A	9485.05	32923.18	8612.08	1,319	192	253	90	
LS-25A	9482.84	32908.36	8612.16	721		567	228	
LS-26A	9460.22	32927.12	8611.63	1,443		68	251	
LS-27A	9502.17	32944.16	8611.74	354	239	230	146	
LS-28A	9430.73	32915.12	6812	11				
LS-29A	9432.65	32944.16	6812.6	29				
LS-30A	9494.39	32897.73	6811.39	3,549		330	556*	

* - Depth of sample greater than two feet from final surface grade (lead criteria = 1,000 ppm).

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TABLE 3-4 (Continued)

Summary of Lead Soil Confirmatory Sampling Results - Separator Area

Sample Location	Y Northing (feet)	X Easting (feet)	Z Elevation (feet AMSL)	Delineation Lead Conc. (ppm)		Confirmatory Lead Conc. (ppm)		
				0 to 1 ft.	1 to 2 ft.	1st Round	2nd Round	3rd Round
LS-31A	9459.05	32896.31	6811.63	33				
LS-32A	9505.88	32887.11		1,157		47	99	
LS-33A	9495.28	32876.55		2,737		136	535*	
LS-34A	9516.64	32898.65		264		610	325	
LS-35A	9527.28	32910.19	6811.26	491				
LS-36A	9505.02	32909.28		11,879		144	103	
LS-38A	9484.72	32866.00	6810.92	137				
LS-39A	9510.38	32857.87	6812.63	38				
LS-40A	9546.85	32895.25	6811.43	34				
LS-41A	9526.03	32874.46	6811.37	66				
LS-42A	9523.37	32912.62				194	23	
LS-43A	9526.43	32886.742				0		
LS-44A	9501.75	32897.44				29	97	
LS-45A	9495.55	32918.11				16	414	
LS-46A	9475.22	32895.22				27	55	
LS-47A	9469.42	32915.74				4,835	387	
LS-48A	9477.24	32948.69				1,172	0	
LS-49A	9517.48	32930.07				134	0	
LS-50A	9526.00	32965.562				93	39	
LS-51A	9537.46	32945.08				154		
LS-52A	9511.05	32941.68				61		
LS-53A	9494.42	32967.06				453	194	
LS-54A	9508.30	33003.86				134	51	
LS-55A	9496.09	32981.38				240	81	
LS-56A	9474.97	32878.01				90		
LS-57A	9542.98	32934.00				194		
LS-58A	9524.97	33014.00				1,472	91	
LS-59A	9537.50	33005.70				51		
LS-60A	9547.47	32956.28				142		
LS-61A	9512.36	33022.28				17		

* - Depth of sample greater than two feet from final surface grade (lead criteria = 1,000 ppm).

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TABLE 3-5

Summary of Lead Soil Confirmatory Sampling Results - Vertical Tank Area

Sample Location	Y Northing (feet)	X Easting (feet)	Z Elevation (feet AMSL)	Delineation Lead Conc. (ppm)	Confirmatory Lead Results (ppm)		
				0 to 1 ft.	1st Round	2nd Round	3rd Round
LT-1	8961.81	33322.76	6815.31	3,177			61
LT-2	8988.64	33336.05	6815.29	1,349		1,002	159
LT-3	8990.61	33366.10	6814.83	554		155	
LT-4	8965.54	33382.55	6814.52	422			
LT-5	8938.75	33369.37	6815.20	252			
LT-6	8936.81	33339.35	6815.97	160			
LT-7	8909.93	33326.00	6815.92	156			
LT-8	8959.87	33292.77	6815.41	9,500		523*	
LT-9	8933.08	33279.53	6815.50	103			
LT-10	9019.37	33409.35	6813.98	645	103		79
LT-11	8983.01	33246.30	6815.50	396			
LT-12	8984.90	33276.23	6815.41	4,850		168	
LT-13	9011.74	33289.50	6816.48	8,736	0	24	
LT-14	9013.65	33319.48	6815.84	160		2,940	117
LT-15	9040.53	33332.81	6814.00	14,900		559	541*
LT-16	9042.42	33362.73	6814.01	5,480	2,136	4880	52
LT-17	9017.49	33379.42	6814.38	1,324		132	58
LT-18	9069.28	33376.04	6813.92	9,420		105	
LT-19	9071.20	33406.01	6813.99	1,249		223	
LT-20	9046.25	33422.67	6813.96	1,683	0	44	
LT-21	9094.28	33359.45	6813.42	5,781		77	
LT-22	9092.32	33329.43	6813.43	20,600		422	
LT-23	9065.52	33316.20	6813.95	13,006		396	
LT-24	9063.60	33286.24	6814.54	2,240		142	
LT-25A	9034.55	33271.11	6812.33	908	629	1,976	446
LT-26	9034.87	33243.01	6815.87	288			
LT-27	9088.63	33269.68	6814.47	364		148	
LT-28	9115.50	33282.99	6814.06	297			
LT-29	9117.40	33312.94	6813.70	2,900		1,044	43
LT-30	9144.22	33326.22	6813.38	153		115	
LT-31	9146.13	33356.17	6813.54	1,060		328	
LT-32	9121.10	33372.73	6813.77	3,900		60	
LT-33	9169.26	33309.66	6813.00	1,394		318	
LT-34A	9173.08	33369.58	6813.93	348			

* - Depth of sample greater than two feet from final surface grade (lead criteria = 1,000 ppm).

TABLE 3-5 (Continued)

Summary of Lead Soil Confirmatory Sampling Results - Vertical Tank Area

Sample Location	Y Northing (feet)	X Easting (feet)	Z Elevation (feet AMSL)	Delineation Lead Conc. (ppm)	Confirmatory Lead Results (ppm)		
				0 to 1 ft.	1st Round	2nd Round	3rd Round
LT-35	9123.02	33402.69	6813.59	1,445	76	110	
LT-36	9098.08	33419.33	6813.65	2,000	261	92	
LT-38	8946.43	33286.08	6815.32	947		401	
LT-39	8983.89	33261.17	6815.46	1,717		230	
LT-40	9035.75	33257.89	6815.36	365		246	
LT-41	9076.09	33277.92	6814.20	4,500		195	
LT-42	9116.44	33297.97	6813.46	963		328	
LT-43	9156.79	33317.97	6813.08		2,054	766	335
LT-44A	9159.54	33362.80	6813.51	328	54		
LT-45	9122.06	33387.69	6813.63			206	
LT-46	9084.65	33412.71	6813.90			51	
LT-49	8978.10	33374.38	6814.49	453			
LT-50	8937.78	33354.36	6815.49	233			
LT-51A	8949.86	33331.38	6815.64	435		304	
LT-52A	8967.98	33414.81	6814.51	221			
LT-53A	8993.55	33427.80	6814.33	274			
LT-54A	9048.63	33453.15	6814.19	724		44	
LT-55A	9073.41	33436.54	6814.11	1,200		456	
LT-56A	9100.01	33450.13	6813.53	1,546		149	
LT-57A	9125.32	33433.12	6813.70	675		149	
LT-58A	9150.82	33416.71	6813.67	562			325
LT-59A	9149.14	33386.62	6813.61	1,416		1,531	103
LT-60A	9196.43	33323.25	6813.12	91			
LT-61A	9142.29	33297.05	6813.26	316			
LT-62A	9167.61	33280.65	6913.03	208			
LT-63A	9140.44	33266.61	6813.19	497			
LT-64A	9024.36	33469.68	6814.32	243			
LT-65A	9075.96	33465.87	6813.94	994		287	
LT-66A	9078.94	33476.10	6814.21	161			
LT-67A	9104.89	33509.27	6814.08	116			
LT-68A	9128.69	33493.35	6813.73	268			
LT-69A	9127.05	33463.20	6813.66	578		50	

TABLE 3-5 (Continued)

Summary of Lead Soil Confirmatory Sampling Results - Vertical Tank Area

Sample Location	Y Northing (feet)	X Easting (feet)	Z Elevation (feet AMSL)	Delineation Lead Conc. (ppm)	Confirmatory Lead Results (ppm)		
				0 to 1 ft.	1st Round	2nd Round	3rd Round
LT-70A	9151.99	33448.20	6814.19	308			
LT-71A	9153.14	33476.71	6813.58	180			
LT-72A	9177.42	33429.63	6813.59	157			
LT-73A	9203.91	33413.68	6813.68	104			
LT-75A	9183.40	33316.69	6812.92	622		178	
LT76A	9168.36	33295.12	6813.19	317			
LT-77A	9006.85	33417.90	6814.26	499			
LT-78A	9035.56	33461.58	6814.05	182			
LT-79A	9177.41	33480.92	6814.35	330			
LT80A	9127.31	33478.07	6813.76	210			
LT81A	8956.81	33263.35	6815.26	1,490		87	
LT82A	9013.09	33252.05	6815.45	1,828		71	
LT83A	9065.58	33257.63	6814.33	537		418	
LT84A	9012.03	33220.61	6816.1	286			
LT85A	8972.16	33213.77	6815.64	310		103	
LT86A	8930.63	33248.57	6815.82	1,963		236	
LT87A	8922.25	33236.47	6816.41	1,760		23	
LT88A	8932.00	33263.11	6815.55	318			
LT89A	8943.41	33239.88	6815.52	1,213	99	205	
LT90A	8934.14	33224.22	6816.66	91			
LT91A	8912.53	33248.40		1,067		3,969	178
LT92A	8909.26	33229.29		180		59	
LT93A	8902.44	33259.13		3,016		84	
LT94A	8896.55	33221.76		81			
LT95A	8899.73	33240.84		57,756		766*	
LT96A	8886.84	33233.26		1,394		167	
LT97A	8876.75	33244.18		262		179	
LT98A	8889.51	33251.99		306	740	303	
LT99A	8881.05	33277.01		97			
LT100A	8908.05	33262.99		362			
LT101A	8849.47	33213.41		109			

* - Depth of sample greater than two feet from final surface grade (lead criteria = 1,000 ppm).

TABLE 3-6

Summary of Lead Soil Confirmatory Sampling Results - Product Area

Sample Location	Y Northing (feet)	X Easting (feet)	Z Elevation (feet AMSL)	Lead Concentration (ppm)	
				0 to 1 ft. (Delineation)	(Confirmatory)
LP-1	8836.24	33689.88	6819.17	87	78*
LP-2	8834.35	33659.94	6819.09	47	
LP-3	8811.26	33706.49	6819.06	131	
LP-4	8784.38	33693.17	6819.22	91	
LP-5	8813.15	33736.44	6818.57	0	
LP-6	8888.10	33686.60	6815.32	2	
LP-7	8863.12	33703.21	6817.79	0	
LP-8	8865.01	33733.15	6814.13	6	
LP-9	8835.29	33674.91	6819.32	10	
LP-14A	8824.18	33698.28	6819.26	46	
LP-15A	8849.50	33697.35	6818.63	107	

* After excavation of 8 inches of soil

3.7 Backfill, Grading and Revegetation

Backfilling and grading of the lead soil excavations was completed in accordance with the RD. All excavations were backfilled with clean fill taken from a borrow area located north of the Site. Samples were taken of soils in the borrow area and analyzed for total lead and hydrocarbons in accordance with the RD prior to transport to the Site. The sample results provided in Appendix 3.12 showed that the fill was "clean soil" with no elevated concentrations of lead or hydrocarbons. Backfill soils were hauled to the Site in dump trucks, placed in the excavated areas and graded and compacted with dozers as shown in Figure 3-24.

During subsequent debris removal activities, the backfilled areas in the office and separator lead soil areas were re-graded by the debris removal contractor. Consequently surveys of backfill elevations in the office, separator, and vertical tank lead soil excavation areas were performed to determine whether these areas were backfilled to original grade and that at least

2 feet of soil remained over any confirmatory sample location where final lead concentrations were between 500 and 1000 ppm. Elevations in most areas exceeded original grade and additional soil was brought in to fill all areas to at least original grade. Final topography of backfilled excavations at the office, separator, and vertical tank lead soil lead areas are provided in Figures 3-25, 3-26, and 3-27, respectively.

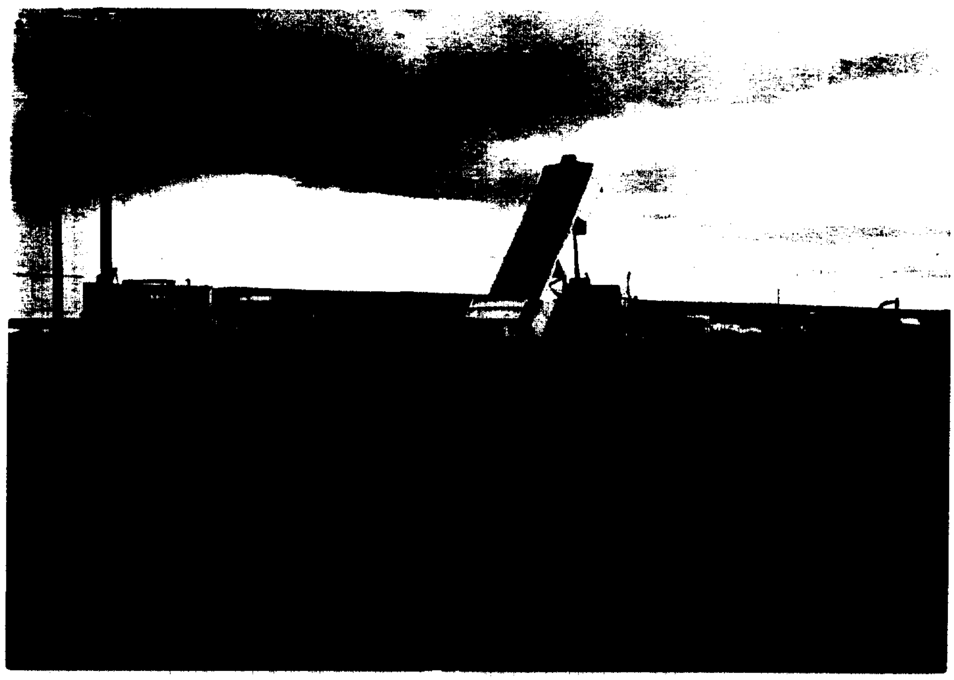


Figure 3-24 - Backfilling of Lead Soil Excavations With Clean Soil

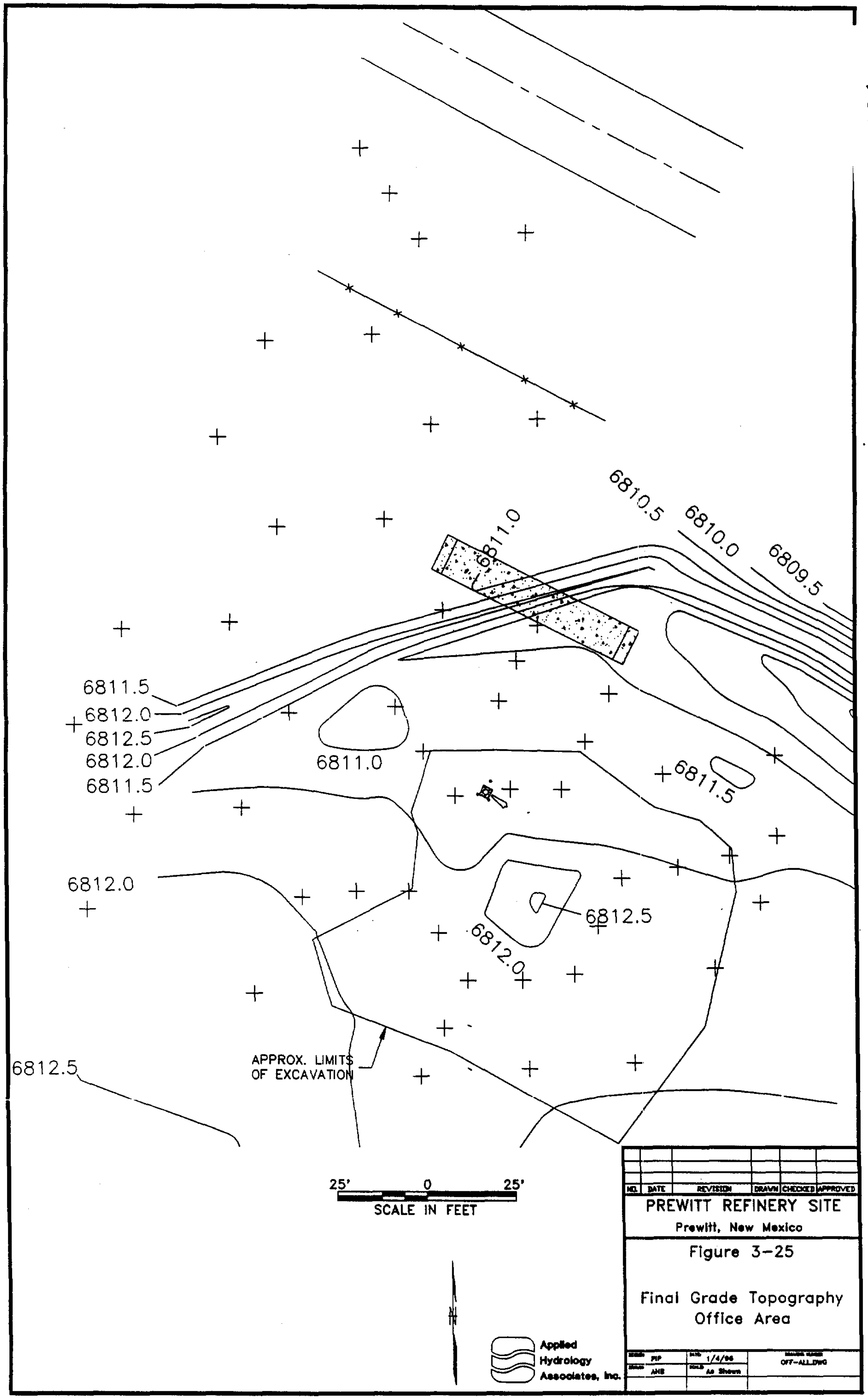
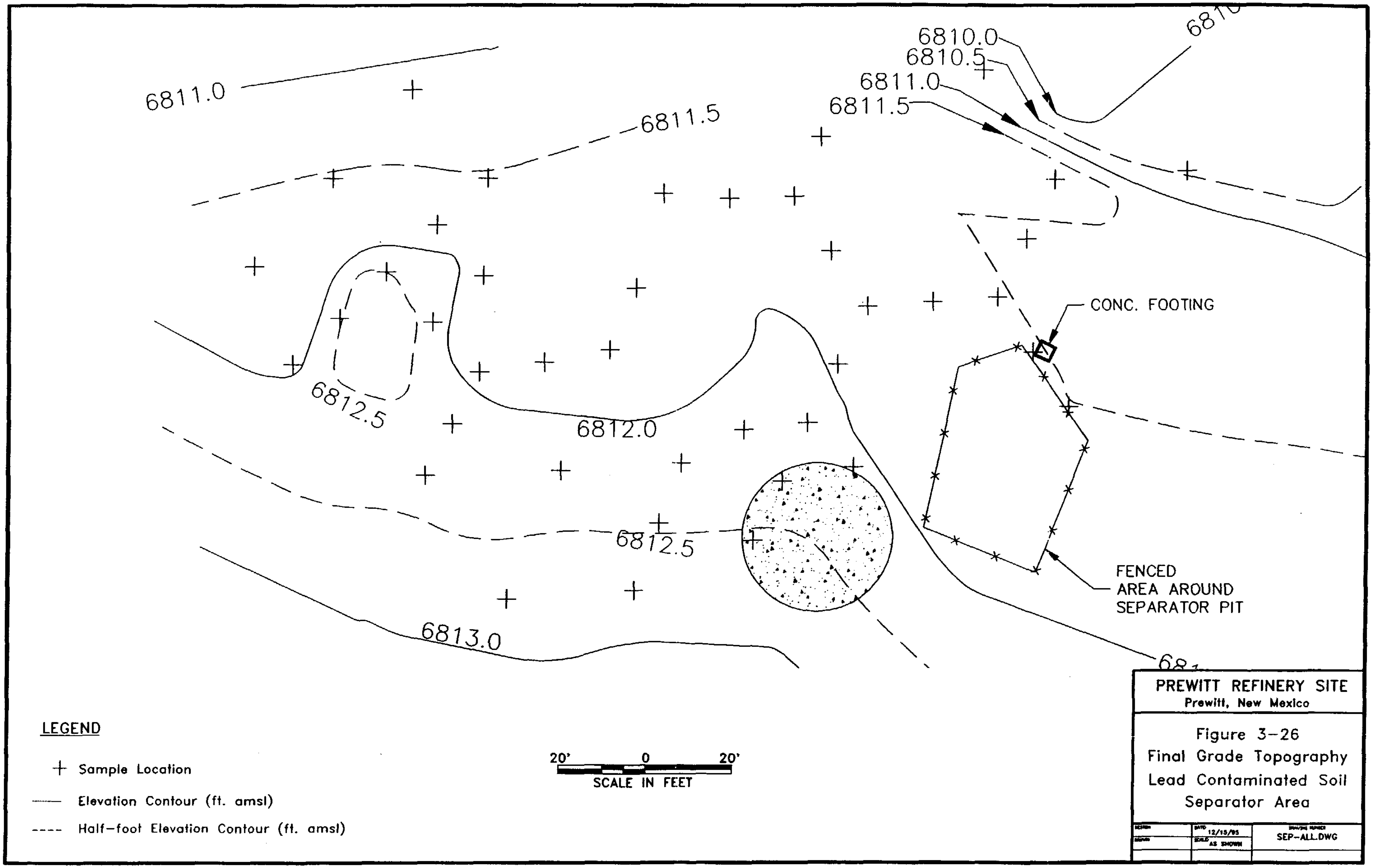


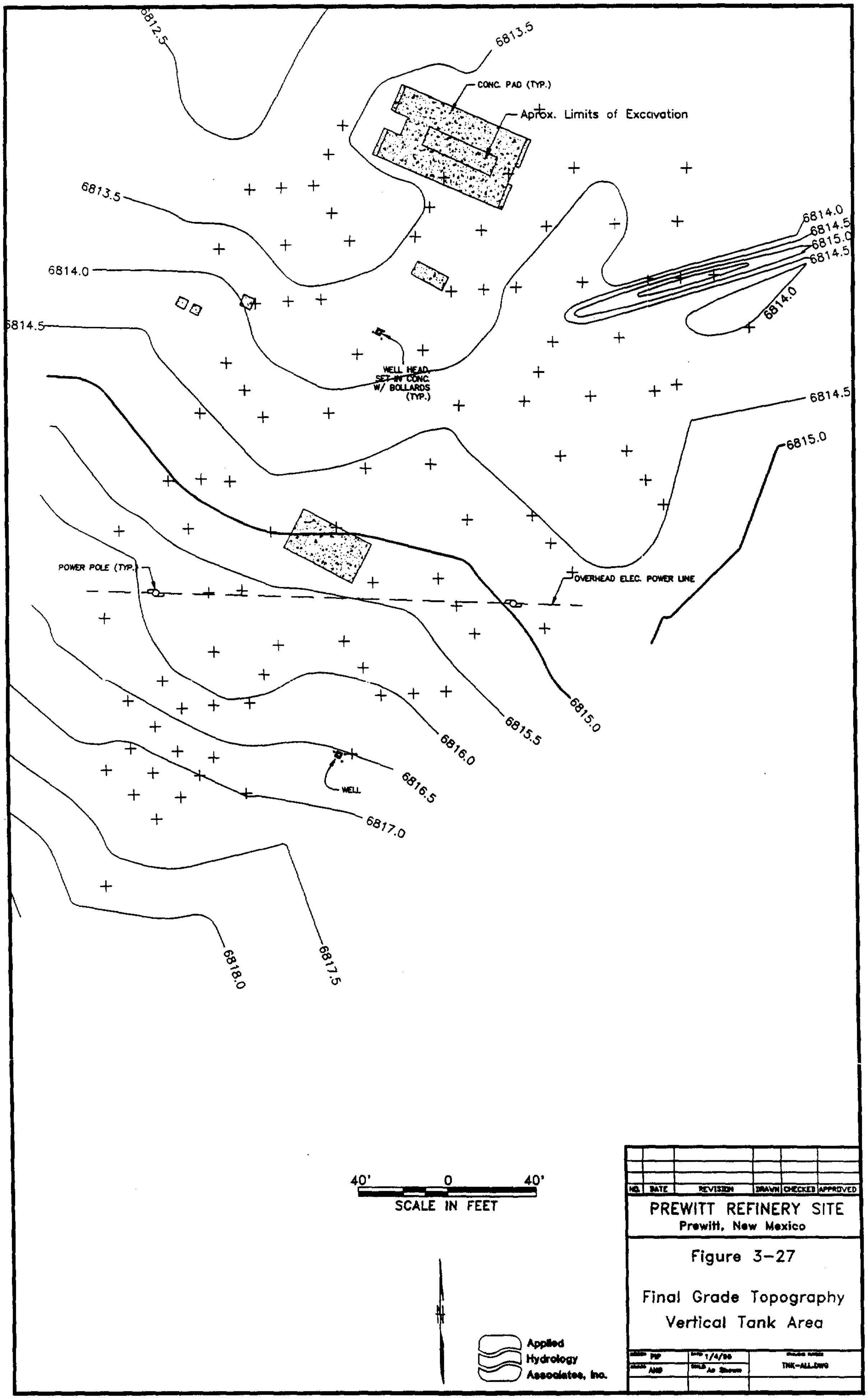
Figure 3-25

Final Grade Topography Office Area

001884


6811.0
6811.5
6810.0
6810.5
6811.0
6811.5
6812.5
6812.0
6812.5
6813.0
CONC. FOOTING
FENCED
AREA AROUND
SEPARATOR PIT
LEGEND
Sample Location
Elevation Contour (ft. amsl)
Half-foot Elevation Contour (ft. amsl)
20'
0
20'
SCALE IN FEET
PREWITT REFINERY SITE
Prewitt, New Mexico
Figure 3-26
Final Grade Topography
Lead Contaminated Soil
Separator Area
12/13/95
AS SHOWN
SEP-ALL.DWG

001885



NO.	DATE	REVISION	DRAWN	CHECKED	APPROVED

PREWITT REFINERY SITE
Prewitt, New Mexico

Figure 3-27

Final Grade Topography
Vertical Tank Area

PIP	1/4/96	TNK-ALL.DWG
AMP	As Shown	

001886

4.0 IMPLEMENTATION OF SEPARATOR REMEDIAL ACTION

The separator was in the north central portion of the Site fenced area, adjacent to old U.S. Route 66. The remedial action for the separator included the removal of the sludge contained in the separator, the metal secondary tank, ancillary piping and equipment, and any contaminated soil beneath the separator. The remedial action also involved either clean-up or removal of the main concrete structure. The separator prior to remediation is shown in Figure 4-1.

The Remedial Action for the separator was implemented in accordance with the RD, the RA Work Plan, and the Order to control or eliminate human exposure to the separator contents and to any contamination associated with the separator structure. This chapter describes the removal action, summarizes the nature and quantity of separator sludge, separator debris, and separator subsoil removed, provides the names and locations of the disposal facilities, which received the separator sludge and separator debris, and provides the results of sampling.

A total quantity of 111 tons of hazardous (F037) separator sludge that was stabilized with cement prior to excavation was transported off-site for thermal desorption treatment at the Bird Environmental Facility in San Leon, Texas. An additional 91 tons of concrete from the separator structure and 5.2 tons of debris consisting of piping and the secondary tank were profiled and transported to the U.S. Ecology facility in Beatty, Nevada for disposal as hazardous (F037) debris. Following removal of the separator structure, 106 cubic yards of separator subsoil were excavated and temporarily stockpiled for treatment in an on-site landfarm in 1996. A composite sample of separator subsoils was analyzed for lead and TCLP-lead. These results indicated that the waste was acceptable for on-site treatment during implementation of the landfarm remedy.

FIGURE 4-1 - Separator Before Remediation

4.1 Remedial Design Requirements

The scope of work in the RD included the following tasks to meet the remedial objectives for the clean-up of the separator:

- Installation of a spill prevention apron around the separator during remediation.
- Stabilization, excavation and treatment of the separator sludge using thermal techniques at a cement kiln permitted to accept RCRA listed hazardous waste, and disposal of treatment residues;

- Removal of the secondary tank, cleaning and inspection of the separator structure, and sampling subsoils beneath the separator structure.

- Excavation and stockpiling for future treatment in the landfarm, separator subsoils which exceed the hydrocarbon soil clean-up criteria and which have lead concentrations of less than 500 ppm.

- Excavation, profiling, and transporting off-site for disposal at a permitted facility, separator subsoils which exceed the hydrocarbon soil clean-up criteria and which have lead concentrations greater than 500 ppm.

- Inspection, sampling, and analyzing the separator structure. If it can be practically treated by abrasive blasting to meet the hazardous debris treatment standards in 40 CFR 268.45, the separator structure will be handled as non-hazardous solid waste and either closed in place or removed and transported off-site to a permitted landfill. If it cannot be practically treated to meet the hazardous debris treatment standards, the separator structure will be handled as listed (F037) hazardous debris waste and transported off-site for disposal at an appropriate permitted facility.

- Backfilling, grading, and revegetation of any excavation associated with separator remediation

4.2 Removal of Separator Sludge

On May 17, 1995 the RA Contractor combined sludge from the secondary tank with the sludge in the main separator, mixed the contents, and collected a composite sample of the separator sludge for waste profiling. Results of profiling, included in Appendix 4.1, indicated BTU content lower than that obtained during the RD and lower than acceptable for cement kiln treatment. An additional sample was taken which confirmed these results. Separator sludge removal was postponed while alternative treatment and disposal options were investigated and discussed with EPA.

On-site stabilization with cement followed by thermal desorption at the Bird Environmental Facility in San Leon, Texas and disposal of treatment residuals at the Chemical Waste Management facility in Carlyss, Louisiana was selected as the most cost-effective option. Following EPA approval of the recommended alternative, the RA Contractor was authorized to proceed with the work. Remedial action was performed as follows:

- An exclusion zone was established around the entire separator area and a 40-mil HDPE liner was placed around the separator structure as a spill prevention apron.

- On-site stabilization of separator sludge was initiated on June 21, 1995 by mixing 20 tons of dry cement into the separator sludges as shown in Figure 4-2. Following stabilization, one truck-load containing stabilized sludge was sent to the Bird Environmental Facility for process testing.

- Following process testing and acceptance by Bird Environmental Facility, the stabilized separator sludge was excavated and transported to the facility as hazardous (F037) separator sludge and treated by thermal desorption.

- Excavated pipe and debris were placed on the apron adjacent to the separator structure as shown in the photo in Figure 4-3.

- Water from decontamination of equipment was stabilized with the separator sludge. A total of 111 tons of hazardous (F037) stabilized waste was transported to the to the Bird Environmental Facility.

FIGURE 4-2 - Stabilizing Separator Sludge with Cement

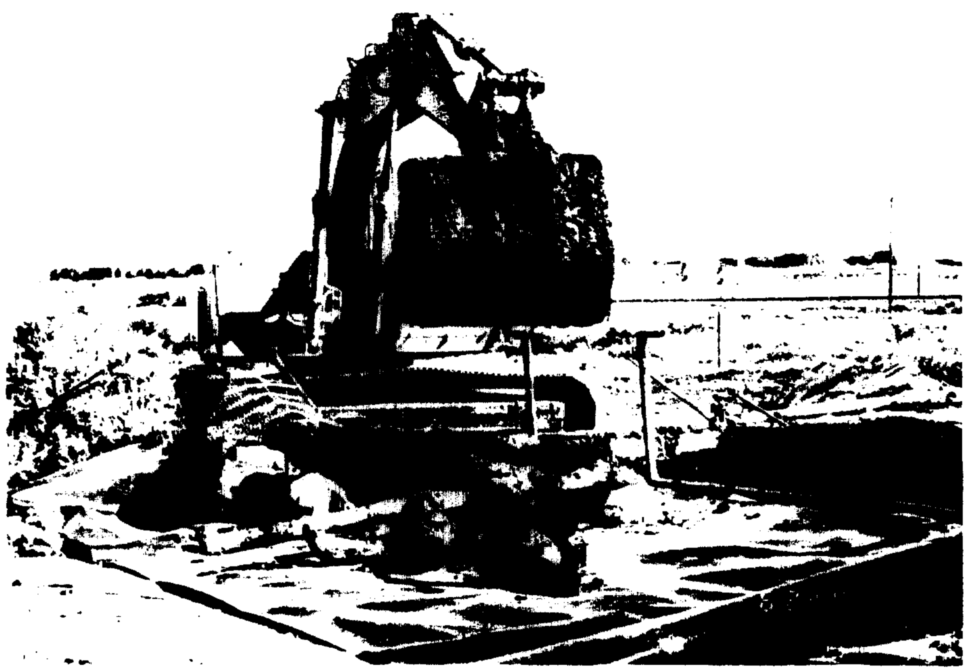


FIGURE 4-3 - Removal of Ancillary Pipe and Equipment

4.3 Remediation of Separator Structure

Following removal of the contents, the separator structure was cleaned and inspected for integrity as shown in the photos in Figure 4-4. In accordance with the RD Report, it was decided to remove the structure and transport the concrete off-site for treatment and disposal as hazardous (F037) debris rather than to attempt cleaning by abrasive blasting to meet the treatment standards for hazardous debris under CFR 268.45. The separator structure was demolished, the concrete waste profiled, and 91 tons of concrete were transported to the U.S. Ecology facility in Beatty, Nevada for disposal as hazardous (F037) debris.

The secondary tank, separator pipes and debris removed and stockpiled during excavation of the stabilized sludge were profiled and loaded onto a truck for off-site treatment and disposal as F037 listed hazardous debris waste. This truckload of 5.2 tons of hazardous (F037) debris was transported to the U.S. Ecology facility in Beatty, Nevada.

4.4 Remediation of Separator Subsoils

The remediation of separator subsoils was addressed consistent with Volume 4 of the RD Report. Target clean-up levels for contaminants of potential concern were set based on exposure to surface soils (0-2 ft.) using a future residential use scenario and based on exposure to subsoils (2-4 feet below the surface) by construction workers. Based on this rationale, excavation of soil was conducted to a depth of 4 feet below the surface and 4 feet out from the sides of the separator and the secondary tank. Although an exposure pathway for soils below a depth of 4 feet does not exist, excavation of soils to a depth of 2 feet below the bottom of the separator was conducted as a precautionary measure. No hydrocarbon staining of soils beneath the separator in the excavation was observed as shown in the photos in Figure 4-5. Approximately 106 cubic yards of soils which were excavated at the separator location were placed in a separate stockpile on the HDPE liner constructed at the lead soil stockpiling location.

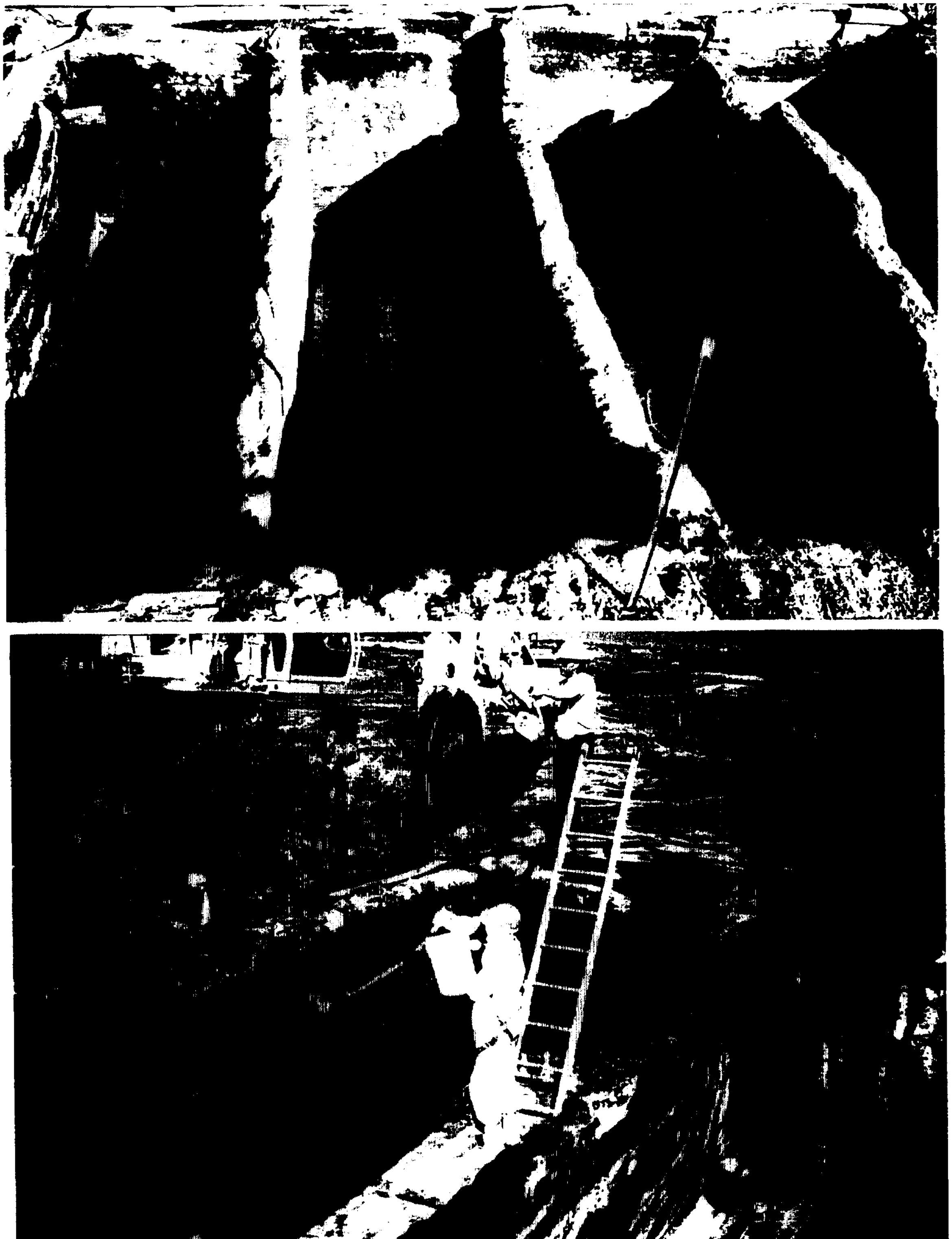


FIGURE 4-4 - Cleaning and Inspection of the Separator Structure

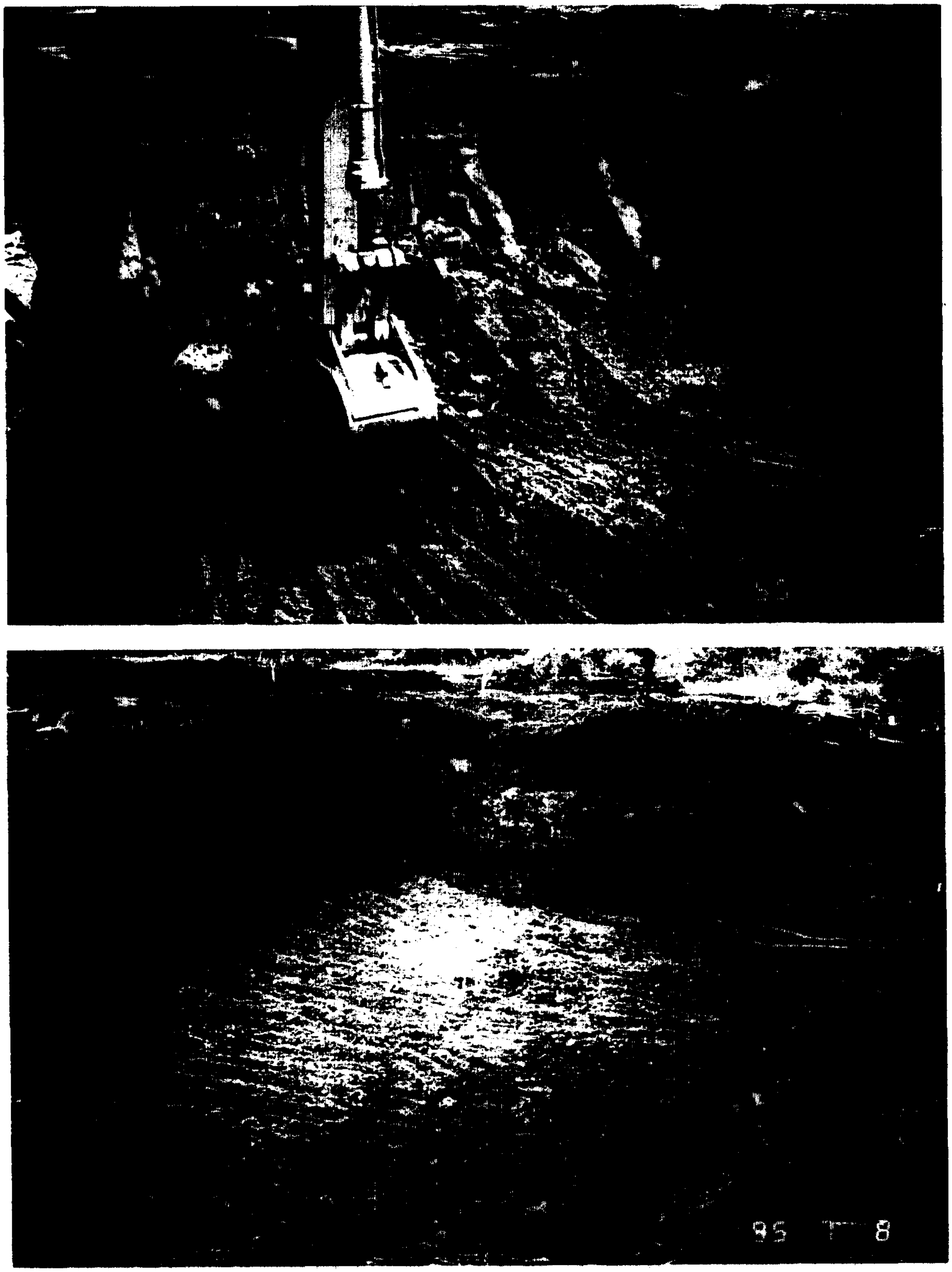


FIGURE 4-5 - Separator Area After Excavation of Separator and Subsoil

Since samples of separator subsoils were not obtained to determine whether excavation was required, a composite sample was collected from five locations within the separator subsoil stockpile to determine whether lead concentrations were acceptable for treatment in the on-site landfarm. The composite sample was first analyzed for total lead using the XRF. The total lead concentration of 125 ppm indicated that the separator subsoils did not exceed the clean-up levels for lead soil on-site. The soil sample was also analyzed for TCLP lead to verify acceptance for treatment in the on-site landfarm. The TCLP lead analysis result of 0.07 mg/l, along with a laboratory analysis of the sample total lead, confirmed that the separator subsoils were acceptable for on-site treatment. These analytical results are provided in Appendix 4.2.

The total lead analysis results for the excavated soils also served as confirmatory samples for lead soil clean-up requirements. Confirmatory sampling and analysis for Contaminants of Potential Concern (CPC) was not required, because the separator excavation was greater than 4-feet in depth and, in accordance with the approved RD Report, there is no CPC clean-up requirement at depths below 4 feet. Visual inspection of the excavation also showed no evidence of hydrocarbon staining of soils beneath the separator.

After discussion and approval by EPA, the separator subsoils were moved to a temporary stockpile located on top of a dry waste pit in the West Pits area. These soils will be treated in the landfarm during landfarm remediation of hydrocarbon-contaminated soils and West Pits contents.

4.5 Backfilling and Revegetation of Separator Excavation

Backfilling of the separator excavation was completed in accordance with the RD. The excavation was backfilled with clean fill taken from a borrow area located north of the Site. Samples were taken of soils in the borrow area and analyzed for total lead and hydrocarbons in accordance with the RD prior to transport to the Site. The sample results provided in Appendix 3.12 showed that the fill material did not exceed any of the clean-up criteria at the Site. Backfill soils were hauled to the Site in dump trucks and placed in the excavation and compacted with dozers.

4.6 Transportation and Disposal of Separator Sludge and Separator Debris

4.6.1 Waste Identification and Waste Characterization

Based on the ROD and the Order, separator sludge was characterized as hazardous (F037) waste. A composite sample of the separator sludge was taken for profiling. These results are included in Appendix 4.1. The separator structure, secondary tank, separator pipes and debris removed and stockpiled during excavation of the stabilized sludge were characterized as hazardous (F037) debris wastes. These hazardous debris wastes were profiled and loaded onto a truck for off-site treatment and disposal as F037 listed hazardous debris waste. These waste profiling results are also included in Appendix 4.1

The separator subsoils were sampled and analyzed as described in Section 4.4. These sampling results confirmed that the separator subsoils were acceptable for treatment in the on-site landfarm.

4.6.2 Waste Manifesting, Transfer, and Disposal

A total quantity of 111 tons of hazardous (F037) separator sludge, which was stabilized with cement, was excavated and transported off-site for treatment at the Bird Environmental Facility in San Leon, Texas. An additional 96.2 tons of hazardous (F037) debris (separator structure, secondary tank, and pipe) were profiled and transported to the U.S. Ecology facility in Beatty, Nevada for disposal.

A waste manifest was prepared for each truck shipment. The loaded trucks were inspected by the transporter and an authorized employee or representative of ARCO or EPNG. Prior to removal from the Site, the authorized employee or representative obtained the signature of the initial transporter and date of acceptance on the manifest. One copy of the manifest was retained at the time of shipment and an additional signed copy was provided by the permitted disposal facility upon receipt of the waste. Manifests for all separator waste shipments are included in Appendix 4.3 and are summarized in Table 4-1.

TABLE 4-1

Separator Waste Manifests

Separator Sludge

Shipped to Bird Environmental Recycling Center, San Leon, Texas

Date Received	Manifest Number	Pay Load (tons)
7/8/95	001	16.87
7/7/95	002	17.92
7/10/95	003	16.19
7/10/95	004	19.05
7/8/95	005	17.13
7/17/95	006	24.06
TOTAL		111.22

Concrete Debris

Shipped to U.S. Ecology Hazardous Waste Landfill, Beatty, Nevada.

Date Received	Manifest Number	Pay Load (tons)
7/27/95	200	20.60
7/28/95	201	13.15
7/28/95	203*	12.13
7/31/95	204	18.81
8/1/95	205	13.41
8/1/95	206	12.68
TOTAL		90.78

* No manifest #202 - break in sequence.

Pipe Debris

Shipped to U.S. Ecology Hazardous Waste Landfill, Beatty, Nevada.

Date Received	Manifest Number	Pay Load (tons)
8/3/95	207	5.17

4.7 Health, Safety and Regulatory Compliance

Separator wastes were classified as "Hazardous Waste Solid N.O.S., Hazard Class 9, NA 3077, PG III (F037)" based on the prior classification in the ROD as listed F037 waste. Following on-site stabilization of separator sludge by dry cement, the separator sludge was excavated and sent to the Bird Environmental Facility for thermal desorption treatment. Following demolition of the separator structure, the concrete, secondary tank, piping and were transported to the U.S. Ecology facility in Beatty, Nevada for disposal as hazardous (F037) debris. The HDPE apron and decontamination wastes were also transported to the U.S. Ecology facility in Beatty, Nevada for disposal as hazardous (F037) debris. These wastes soils were labeled in accordance with the DOT requirements under 49 CFR part 172 and transported for off-site disposal within 90 days.

Prior to the off-site shipment of any hazardous waste to an out-of-state waste management facility, ARCO/EPNG provided written notification to the appropriate environmental official in the state receiving the wastes and to EPA's RPM. Copies of the notification letters to the State of Nevada, the State of Texas, and the U.S. EPA are provided in Appendix 4.4. These notifications provided: (1) the name and location of the facility receiving the wastes; (2) the expected type and quantity of hazardous waste shipped; (3) the expected schedule for shipment; and (4) the method of transportation.

Separator sludges were treated in accordance with 40 CFR 264.270, Subpart M at Bird Environmental facility in San Leon, Texas, prior to land disposal at the Chemical Waste Management facility in Carlyss, Louisiana.

All work on the separator was performed in accordance with the RA Health and Safety Plan. An exclusion zone was established around the separator prior to start of remedial action. Only authorized personnel were allowed within the exclusion zone. Entry for inspection of the separator structure was performed in accordance with the OSHA Permit Required Confined Space Standard (29 CFR 1910.146). All remedial action work on the separator was completed with no injuries or incidents of health or safety concerns.

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5.0 EXCAVATION AND STOCKPILING OF HYDROCARBON-CONTAMINATED SOILS

The RD for the excavation and landfarm treatment of West Pits contents and hydrocarbon-contaminated soils was approved by EPA on October 26, 1995. Although this work is scheduled to be implemented in 1996, excavation and temporary stockpiling of some hydrocarbon-contaminated soils was required to complete remedial action of lead-contaminated soil. Hydrocarbon-contaminated soils were also encountered during construction of the subsurface remedy and during implementation of general debris clean-up. These hydrocarbon-contaminated soils were also excavated and placed in a temporary stockpile.

The excavation and stockpiling of hydrocarbon-contaminated soils encountered during implementation of remedial action and debris removal work at the Site in 1995 was completed in accordance with the approved RD and the RA Work Plan. This chapter describes the excavation and stockpiling of hydrocarbon soil and provides the results of confirmatory sampling. The remedial action activities for hydrocarbon-contaminated soils encountered during lead-contaminated soil remediation, subsurface remedy construction, and general debris clean-up are presented in separate subsections of this chapter.

A total quantity of approximately 2,000 cubic yards of non-hazardous hydrocarbon-contaminated soil were excavated and temporarily stockpiled. Consistent with the RD Volume 4, composite soil samples were collected for confirmatory sampling and analyzed using EPA Method 8270 at all hydrocarbon soil excavations of less than 4 feet in depth. The confirmatory sampling conducted during this work indicates that clean-up criteria for hydrocarbon soils were met at all the hydrocarbon-contaminated soil excavations.

5.1 Remedial Action Design and Confirmation Requirements

The scope of work in the Volume 4 of the RD Report includes the following tasks to meet the remedial objectives for the excavation of hydrocarbon-contaminated soils:

- Field locate areas previously identified with hydrocarbon-contamination.
- Excavate and stockpile hydrocarbon-contaminated soils.
- Perform post-excavation confirmatory sampling of the open excavations to verify the removal of hydrocarbon-contaminated soils.
- Perform additional excavation, stockpiling, and confirmatory sampling, as necessary, if any confirmatory sampling of the excavation reveals remaining areas above clean-up concentrations.
- Backfill and grade the excavated area.

5.2 Hydrocarbon-Contaminated Soils Encountered During Lead Soil Remediation

Following excavation and confirmatory sampling of the lead-contaminated soil locations at the Site, the excavations were visually inspected by the SC/QAO and EPA oversight personnel for hydrocarbon staining of soils. Hydrocarbon stained soils were not observed within the completed soil excavations in the Vertical Tank Area, the Office Area, or the Product Area. However, hydrocarbon stained soils were observed within the lead-contaminated soil excavation in the Separator Area as shown in Figure 5-1. Also, sampling data from the RI were reviewed to field locate any area previously identified with hydrocarbon-contamination above the clean-up criteria. Based on the review of the RI data, no sample locations within the lead soil excavation areas were found to have hydrocarbon-contamination above the clean-up criteria. However, one sample taken from a location near the separator was found to have elevated detection limits for Polynuclear Aromatic Hydrocarbons (PAHs) which were above the clean-up criteria.

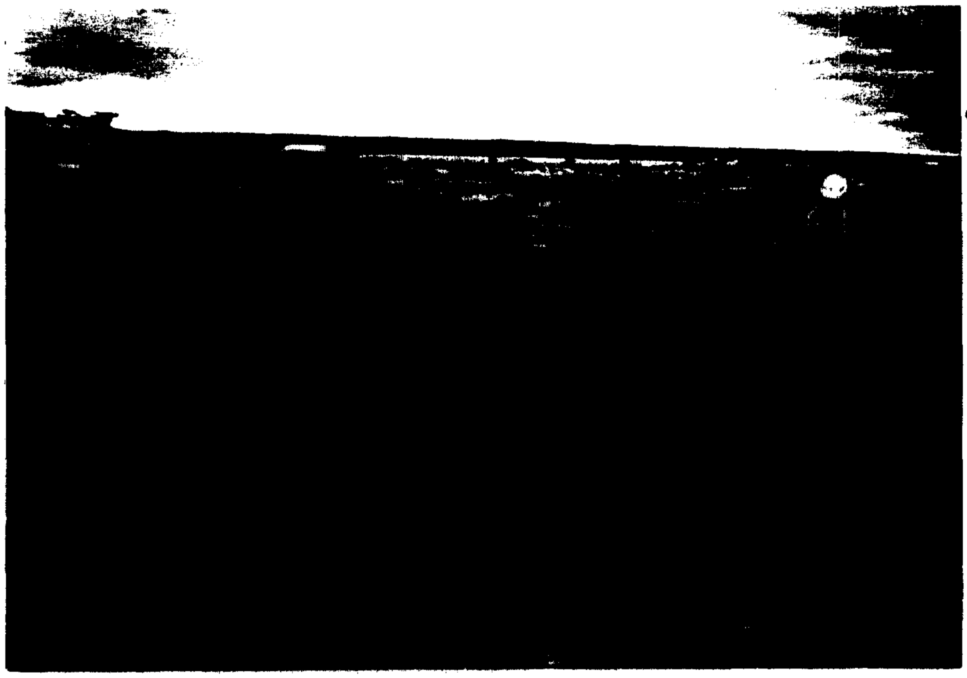

FIGURE 5-1 - Hydrocarbon-Contaminated Soil at the Separator Area Lead-Contaminated Soil Excavation

Based on the inspection and review, it was decided to remove the hydrocarbon stained soils from the excavation in the separator area to a depth of at least 2-feet below original grade. Approximately 200 cubic yards of hydrocarbon stained soil were excavated and temporarily stockpiled on HDPE liner near the lead-contaminated soil stockpiles.

Following excavation of hydrocarbon stained soils, the subsoil in the location of hydrocarbon soil excavation was sampled and analyzed using EPA Method 8270 in accordance with the Addendum to Remedial Action Sampling and Analysis Plan, Prewitt Refinery Site. A composite sample for confirmatory analysis was obtained from three aliquots collected on a 30 foot hexagonal sampling grid established over the hydrocarbon soil excavation area. The confirmatory sample analysis results (Sample SA-CS-1 in Appendix 5.1) indicate a benzo (a) pyrene equivalent sum of all PAHs of 6.2 mg/kg which is below the clean-up level of 20 mg/kg (ppm) for soil at 2 to 4 feet below the surface. Therefore, no additional excavation was required and the excavation was backfilled with clean soil from the borrow area.

5.3 Hydrocarbon-Contaminated Soils Encountered in Construction of the Subsurface Remedy

The RA Contractor encountered soils with significant hydrocarbon content during trenching in the vicinity of Well MW-20S and at a waste pit located near the separator. A total of about 160 cubic yards of hydrocarbon-contaminated soil were excavated and stockpiled during construction of the subsurface system. Hydrocarbon soils at one of the West Pits located east of the separator were encountered during the initial construction work on the trench to the MW-4S NAPL location. Following approval from EPA, the location of the trench to the MW-4S NAPL location was changed to avoid further excavation of the waste pit and to prevent possible disturbance of the new piping during subsequent hydrocarbon-contaminated soil remediation.

Hydrocarbon-contaminated soil were also excavated during the construction of the trench to the MW-20S NAPL location. The hydrocarbon-contaminated soils removed during trenching for the subsurface remedial action construction were temporarily stockpiled on HDPE liner near the lead-contaminated soil stockpiles.

Confirmatory samples were not taken at the West Pit near the separator because excavation of hydrocarbon-contaminated soil excavation in this area was not completed at this time. Also, confirmatory samples were not taken from the subsoil in the trench to the MW-20S NAPL location because the trench was excavated to a depth of 4 feet in the hydrocarbon soil location.

A malodorous greenish stained soil was also encountered during construction of a trench in the South NAPL area. This soil (about 1 cubic yard) was removed, temporarily stockpiled, and sampled. The sample analysis results (Sample SNAPL Trench in Appendix 5.1) detected various phenols at concentrations above detection limits. Based on these results, the sum of 2-, 3- and 4- methylphenol (o-, m-, and p-cresol) was 11.7 mg/kg. If all the methylphenols in the sample were to be removed in a TCLP test, the maximum concentration would be 0.59 mg/L.

Since the TCLP limit for methylphenols is 200 mg/L, the excavated soil is not hazardous. Furthermore, methylphenols have been shown to biodegrade quickly when applied to soil (Howard, P. H., 1990. Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Volume 1 - Large Production and Priority Pollutants).

5.4 Hydrocarbon-Contaminated Soils Encountered During Debris Removal

Potential hydrocarbon-contaminated soils were encountered during debris removal at the West Pit located east of the separator, in the vicinity of Well MW-20S, and at a location southwest of the separator. The first two were locations where hydrocarbon-contaminated soils were also encountered during construction of the subsurface remedy. Following discussion with and agreement from EPA, the potential hydrocarbon-contaminated soils from these locations were excavated and temporarily stockpiled in order to complete the debris removal and backfilling, grading, and revegetation of the debris removal area. Philip Environmental performed this work as part of debris removal activities at the Site. About 1,530 cubic yards of potential hydrocarbon-contaminated soils were removed and stockpiled during debris removal work.

The soil at the West Pit located east of the separator and at the hydrocarbon-contaminated soil location near Well MW-20S was excavated to a depth of at least 4 feet as shown in Figure 5-2. The hydrocarbon staining extended to a depth of about 3 feet at both locations. However, excavation continued to a depth of 4 feet or greater to allow backfilling to proceed without having to wait for confirmatory sampling results. Confirmatory samples were not required and were not taken from the subsoil at these two locations because there is no action level for remediation of hydrocarbon-contaminated soils at depths greater than 4 feet. Survey control was used to confirm excavation depths prior to backfilling with clean soil.

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FIGURE 5-2 - Excavation of Hydrocarbon-Contaminated Soil at MW-20S Location

At the third removal location southeast of the separator, the soil was excavated to a depth of at least 2-feet below original grade as shown in Figure 5-3. Confirmatory sampling of subsoil was completed following excavation of hydrocarbon-contaminated soils at this location. A composite sample for confirmatory analysis was obtained from three aliquots collected on a 30 foot isometric hexagonal sampling grid established over the hydrocarbon soil excavation area in accordance with the Addendum to the RA Sampling and Analysis Plan submitted with the RD Report for the Landfarm Remedy. The confirmatory sampling results for this sample, which is designated as C2-ES-1 and is provided in Appendix 5.1, indicate a benzo (a) pyrene equivalent sum of all PAHs of 0.013 mg/kg which is well below the action level of 20 mg/kg for removal below 2 feet.

FIGURE 5-3 - Hydrocarbon-Contaminated Soil Excavation at Location Southwest of the Separator

5.5 Stockpiling of Hydrocarbon-Contaminated Soils and Backfilling of Excavations

After discussion and approval from EPA, the hydrocarbon-contaminated soil that was excavated from the base of the lead soil excavation in the separator area, the hydrocarbon soil excavated during construction of the subsurface remedy, and the separator subsoils excavated during implementation of the remedy for the separator were moved to a temporary stockpile located on top of a dry waste pit in the West Pits area near the future landfarm. Hydrocarbon-contaminated soils removed during debris removal work were also temporarily stockpiled with other hydrocarbon-contaminated soil at the West Pits area near the future landfarm. These soils will be treated in the landfarm in 1996 following construction of the landfarm remedy.

The excavation of hydrocarbon-contaminated soils at the lead-contaminated soil location near the separator was backfilled with clean soil from the borrow area following receipt of confirmatory sampling results. At the locations where hydrocarbon-contaminated soils were removed during construction of the subsurface remedy, the trenches were completed in accordance with the design with clean soil used for backfilling. The lead-contaminated soil excavations conducted during debris removal at the West Pit located east of the separator, at the location near Well MW-20S, and at a location southwest of the separator were backfilled with clean soil as shown in Figure 5-4. Over 15,000 cubic yards of clean soil excavated during construction of the diversion channels were brought in for backfilling, these hydrocarbon soil locations and for backfilling and grading the ACM removal areas and the debris removal areas.

A composite sample of the soils from the diversion channel, which were used for backfilling and grading the areas associated with hydrocarbon soil excavation, ACM excavation, and debris removal, was collected and analyzed for lead and semivolatile organics. The results, designated as "Diversion Channel" in Appendix 5.2, indicate no detectable concentrations of lead or semivolatile organics.

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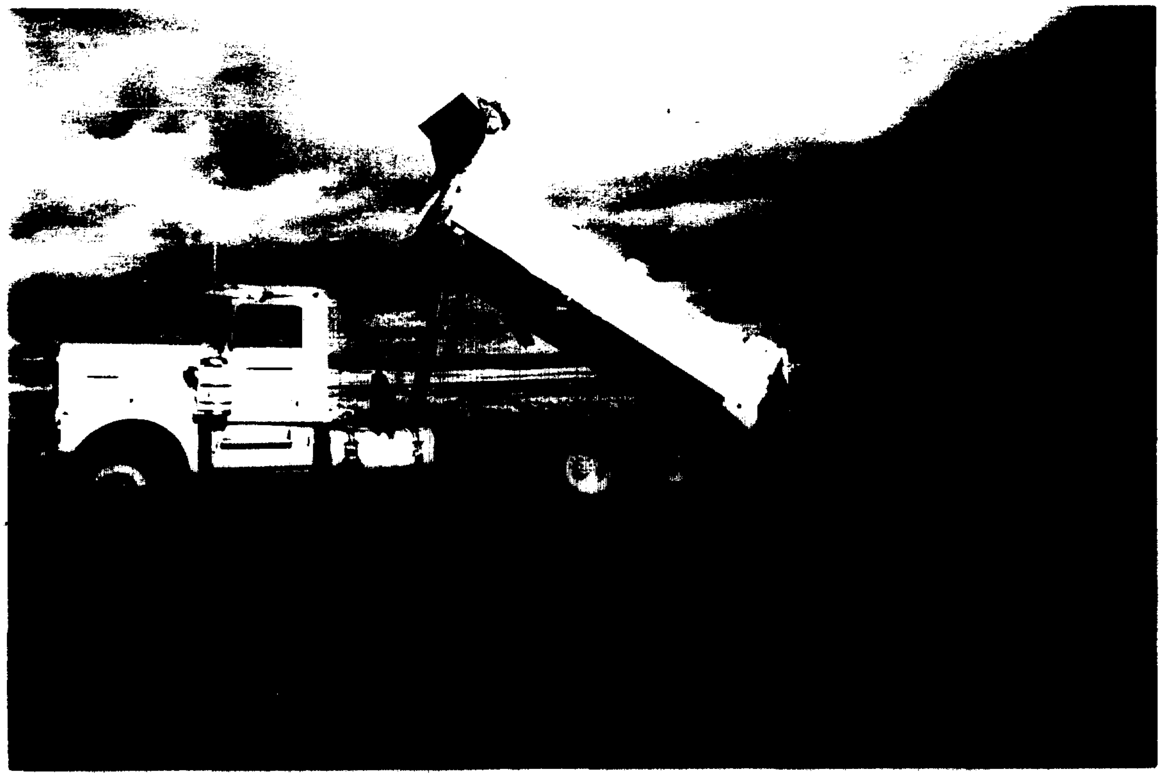

FIGURE 5-4 - Backfilling of Hydrocarbon-Contaminated Soil Excavation at West Pit Located Near the Separator

Following backfilling and grading of the hydrocarbon soil excavations, the ACM removal areas, and the debris removal areas, the graded areas were fertilized and disked. Revegetation of the disked areas was performed by drill seeding in accordance with the mixture and seeding rate specified in the RD. Following drill seeding, straw mulch was applied at a rate of two tons per acre.

5.6 Health, Safety, and Regulatory Compliance

All work on excavation and stockpiling of hydrocarbon-contaminated soils was performed in accordance with the RA Health and Safety Plan. Water was applied during excavation to minimize dust. No off-site shipment of any waste was performed in association with the hydrocarbon-contaminated soils. Pipe and metal debris encountered during debris removal were transported off-site for disposal as solid waste. Equipment was decontaminated at the decontamination facility prior to removal from the Site. All remedial action work was completed with no injuries or incidents of health or safety concern.

6.0 REMEDY INSPECTION AND CERTIFICATION

This chapter of the RA Completion Report describes the Pre-Certification/Pre-Final Inspection and the Final Certification Inspection. It also includes the EPA certification of completion of the surface remedy components (i.e., lead-contaminated soils, ACMs, the separator). For these surface remedy components, which do not have a Long-Term Remedial Action (LTRA) phase, the Pre-Final Inspections and the Pre-Certification Inspection, required under the Order, were combined into one Pre-Final Inspection as described in the approved RA Work Plan.

6.1 The Pre-Certification/Pre-Final Inspection

The Pre-Certification/Pre-Final inspection for remediation of asbestos containing materials, lead-contaminated soil, and the separator was conducted on November 28, 1995. Representatives from EPA, the U.S. Army Corps of Engineers, Navajo Superfund Programs, ARCO, EPNG, Smith Environmental Technology, and Applied Hydrology Associates, Inc. were present for this inspection. The surface remediation activities were reviewed and discussed and photos of the RA activities were examined. Confirmatory sampling data were also reviewed showing attainment of performance standards. Results of off-site disposal operations were presented, including the total volume and characterization of the wastes and materials removed, and the name and location of the disposal facility receiving the materials. A Site inspection was conducted following review of the records and data. At the time of the inspection, all work had been completed except revegetation of backfilled and graded areas which was in progress. No outstanding issues or punch list items were identified during the Pre-Certification/Pre-Final Inspection.

The Pre-Certification inspection for hydrocarbon-contaminated soils that were excavated and temporarily stockpiled during implementation of this work will be addressed during completion of RA Work Plan for the Landfarm.

6.2 The Final Certification Inspection

As specified in the Order and the RA Work Plan, EPA Certification of Completion of these surface remedy components, which do not have a Long Term Remedial Action (LTRA) phase, will be obtained following submittal of the Draft RA Completion Report and completion of a certification inspection. The Draft RA Completion Report was submitted to EPA on February 23, 1996. EPA completed its certification inspection of the completed surface remedy components on March 7, 1996.

6.3 EPA Certification of Completion

As specified in the Order and the RA Work Plan, the EPA Certification of Completion of the surface remedy components for asbestos containing materials, lead-contaminated soils, and the separator was issued following completion of the Certification Inspection and review of the Draft RA Completion Report. The EPA Certification of Completion, dated March 19, 1996, is provided on the following page.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

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ENVIRONMENTAL AFFAIRS

March 19, 1996

Mr. Gerry Garibay
El Paso Natural Gas Company
P.O. Box 1492
El Paso, Texas 79978

Mr. Ron Ziegler
ARCO
307 East Park Avenue
Suite 400
Anaconda, Montana 59711

Re: Certification of Completion of the Surface Remediation

Dear Gentlemen:

The Environmental Protection Agency (EPA), the New Mexico Environment Department (NMED) and the Navajo Superfund Office (NSO) have completed their review of the Remedial Action Completion Report for the Asbestos Containing Material, Lead-Contaminated Soil and Separator. Based on the information contained in the aforementioned report and the pre-certification inspection, and in accordance with Unilateral Administrative Order (6-17-93) EPA is providing ARCO and El Paso Natural Gas with notification that the Remedial Action for the surface soils, exclusive of the landfarm activities, has been completed.

EPA intends to enter into discussions with NMED and NSO on the possibility of deleting the surface portion of the site, excluding the landfarm from the National Priorities List . I will keep you informed of any decisions made with regard to the deletion.

EPA appreciates the progress the companies have made and looks forward to working with both companies on the completion of the landfarm and the subsurface remediation.

Sincerely,

Monica Chapa Smith
LA/NM Superfund Branch (16SF-LN)

cc: Julie Curtiss
Donna Russell
Darren J. Padilla